1932 MILL and MILL EQUIPMENT NUMBER

PAPER TRADE JOURNAL

CT 31 19

Vol. XCV OCTOBER 27, 1932 No. 17

PUBLISHERS WANT BETTER PAPER

SPOTTY PAPER TABOO

"WE WANT a better, clearer, smoother sheet," is the cry of newspaper and magazine publishers today. The rough, spotty paper of the past has no place in the field of publishing now. Advertising and editorial standards have been raised. Halftone printing has increased over 500 per cent in five years. Full color printing, even in newspapers, is fast expanding into the editiorial and the advertising sections.

BELOIT SHAKE AND SUCTION ROLLS — THE ANSWER

Better newsprint, magazine and book papers to meet today's specifications can be produced with the modern Beloit Shake and Suction Rolls. Numerous installations prove it. Felt, wire and press roll markings are reduced, the bulk and strength of the sheet is increased to better meet the requirements for color printing, and the formation of the sheet itself is improved.

Beloit is rendering exceptional service to papermills with the vision to see the many important developments taking place. This service is available to the paper industry. Write us in confidence.

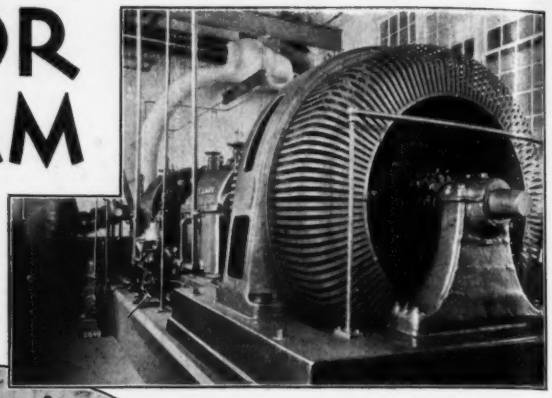
The *Beloit* Way Is the *Modern* Way

BELOIT IRON WORKS, BELOIT, WIS., U. S. A.

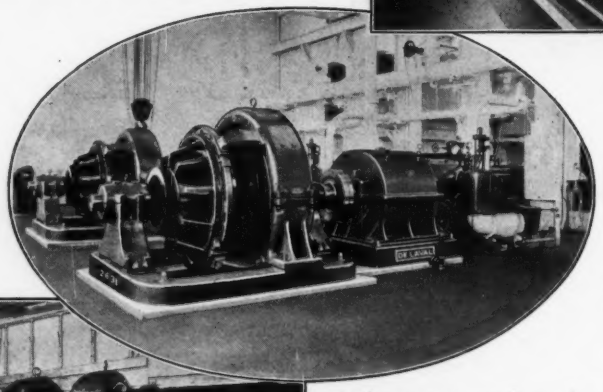
The BELOIT

BELOIT IRON WORKS PAPER MACH'Y BELOIT WIS

• • •HEATING OR PROCESS STEAM *makes* CHEAP POWER

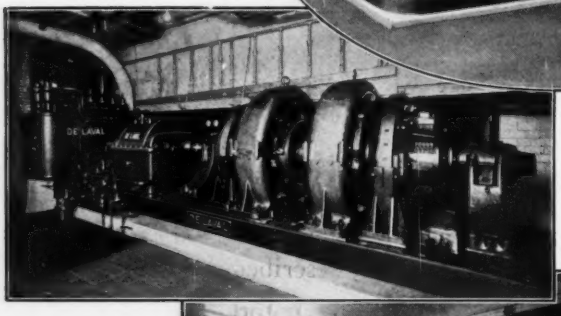


Above—1250 kw. geared turbine driven a.c. generating set in copper recovery plant; exhaust steam is supplied to process under 18 lb. back pressure



Below—1000 kw. geared turbine d.c. generating set supplying power to a newspaper printing establishment, also exhaust steam for heating and manufacturing

At left—Two 1500 kw. geared turbine driven d.c. generating sets supplying power and steam at 80 lb. and 12 lb. gage pressures in a cloth finishing plant

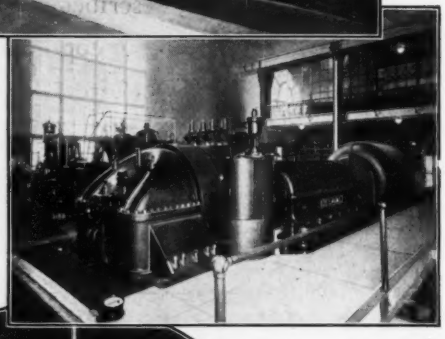


WITH modern boiler room equipment, high pressure steam costs little more than low pressure steam, but high pressure can generate a large amount of power in expanding to a lower pressure.

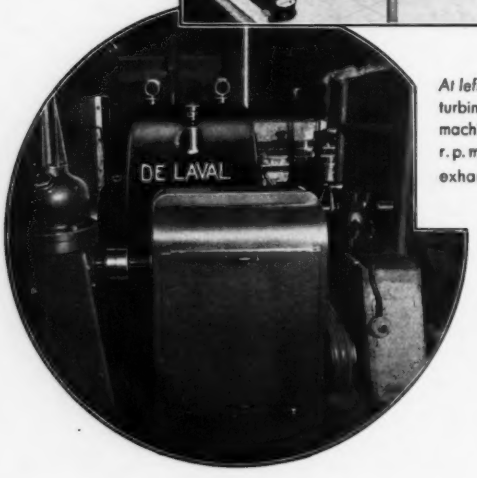
The cost of power generated by De Laval steam turbines from steam used in processing or heating is exceedingly low.

The heat balance between demand for process steam and power requirements is maintained automatically.

Any plant using both power and low pressure steam may effect great economies by enlisting the services of De Laval engineers.



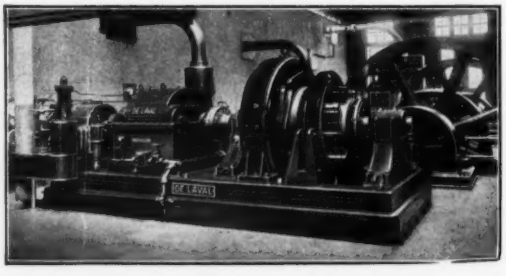
At right—One of two 5000 kw. geared turbine driven a. c. generating sets supplying power and steam for heating purposes to the Capitol at Washington



At left—375 hp. geared turbine driving a paper machine at 150 to 600 r.p.m., and supplying exhaust steam to rolls

DE LAVAL STEAM TURBINE CO.

Trenton, New Jersey 3136



At right—1000 kw geared turbine driven d.c. generating unit in power plant of a medical school, exhaust used for heating

Entered as second-class matter, March 3, 1925, at the Post Office at East Stroudsburg, Pa., under the Act of Congress of March 3, 1879. Published every Thursday by the Lockwood Trade Journal Co., at 34 N. Crystal St., East Stroudsburg, Pa. Executive and Editorial Offices: 10 E. 39th St., New York, N. Y.

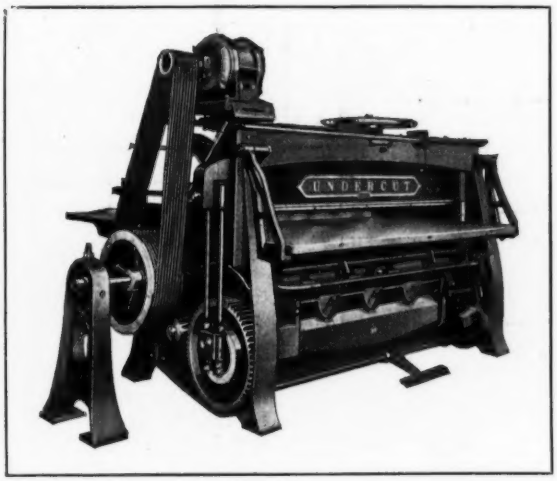
★ ★ ★ ★ ★ ★ ★

All Hands

BELOW

Two distinct throws of the starting lever... both hands below the cutting table... then *only* can the knife start to cut... that's complete safety... Dual Control!

Developed by Smith and Winchester,



Dual Control ends danger of accidental starts. A visitor leaning on the control mechanism, a worker brushing against the cutter, a sudden jar, will have no effect. At all times, the operator has complete command of the cutting stroke. *Now*, with perfect safety, all operating mechanism is placed within easy reach. Faster work, fewer motions, greater accuracy is possible.

Ten other advantages exclusive to users of Undercuts are described in a bulletin that is just off the press. Your copy will be sent without obligation... Address, South Windham.

Undercuts are built in a complete *range of sizes:* 34", 38", 44", 48", 50", 56", 63", 69", 76", 84", 92", *and larger.*

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The SMITH & WINCHESTER

Manufacturing *Company*

PLANT AND OFFICES AT SOUTH WINDHAM, CONNECTICUT

GENTLEMEN:

Kindly send, without obligation, your latest bulletin, "Undercut Automatic Paper Cutting Machines."

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STREET & No. ..... CITY ..... STATE .....

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PROMPTNESS

Promptness is the essence of all good business.

Prompt, efficient service at all times is the watchword in the home of **TENAX FELTS.**

Try **TENAX FELTS** in any position for every grade of paper and board.

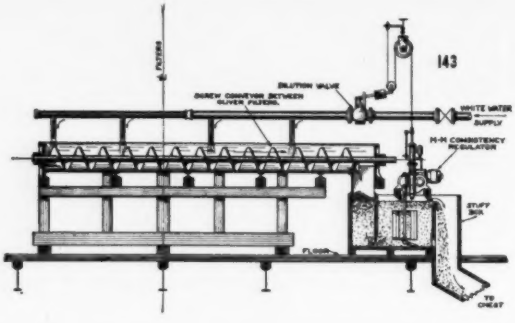
TENAX FELTS in all styles for all purposes.

NON-USERS ARE THE LOSERS.

LOCKPORT FELT COMPANY

NEWFANE, N. Y.

REGULATION OF UNLIMITED VOLUME OF STOCK AT THE CUMBERLAND MILLS PLANT OF S. D. WARREN COMPANY BY A MEYERS-MESCO MODEL "H" STOCK CONSISTENCY REGULATOR.



MEYERS-MESCO REGULATION.

(1) Consistency Regulator

(2) Automatic Water Feeder
Model "B" for batch beaters
Model "C" for continuous beaters

(3) Beater Stock Recorder

MERRITT ENGINEERING & SALES CO.
LOCKPORT, N. Y.

This machine may be used for STRAIGHT REGULATION, or for SIMULTANEOUS DILUTION and regulation combined.

INITIAL CONSISTENCY may be anything and FINAL CONSISTENCY any desired amount between 2.5% and 7%.

Black liquor, white water or fresh water may be used as the REGULATING MEDIUM.

Stock flow may be INTERMITTENT or VARIABLE in volume.

The Model "H" is maintaining ACCURACY under the most difficult conditions.

It is especially designed for handling a BIG VOLUME and the diagram shows how it is done at the S. D. Warren plant.

DU PONT HALOPONT COLORS

. . . in white shades

DU PONT Halopont colors are particularly suitable for the production of white shades on all papers, from book and magazine to bond and writing. They are unequalled for glassine shades, as they are not dulled in super-calendering.

These Halopont Colors can be added to the beater in dry powder form and are quick-developing . . . possess excellent fastness to light and produce brilliant white shades.

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A medium blue suitable for the greener shades of white.

HALOPONT BLUE R

Suitable for the redder shades and may be used in combination with Halopont Blue M to produce any of the medium white shades.

HALOPONT VIOLET

A bright violet suitable for pinkish whites and as shading color with Halopont Blue M and R.

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REG. U. S. PAT. OFF.

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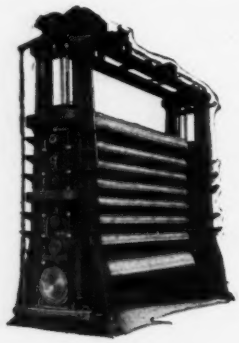
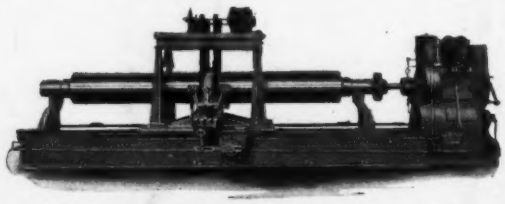
"Quality Machines for Paper Mills"



Lobdell Calender Stacks are accurate, durable, easily operated machines. Rolls are of "Puraloy" (mentioned below) and stacks are equipped with "floor controlled" Lifting Device, which may be operated by Motor, Ratchet or Hydraulic Cylinder. Modern, Trouble-free lubrication is another feature of these widely used and endorsed Calender Stacks.



The Lobdell Roll Grinding Machine, designed primarily for grinding paper mill Calender Rolls, is the most rapid and accurate machine obtainable for the purpose.
Simplicity of design; Rigidity of wheel mounting; the "exclusive" Automatic Crowning Device; the special Provision for leveling the bed (to compensate for wear and foundation changes),—and the Automatic lubrication,—make this superior efficiency possible.

LOBDELL "PURALOY" Chilled Calender Rolls

Lobdell "Puraloy" Chilled Calender Rolls assure maximum hardness and a perfect surface. They minimize pitting and wear, and are therefore ideal for the very severe conditions of water finish papers . . . . an "exclusive" Lobdell Product.

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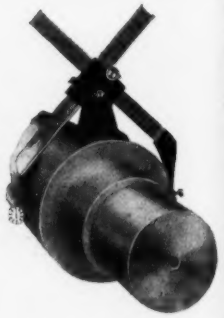
CAR WHEEL COMPANY
96 Years in Business
WILMINGTON·DELAWARE



Lobdell Improved Micrometer Roll Caliper,—an indispensable instrument for all mills,—either to keep a check on re-grinding, or on the condition of Calender and Press Rolls. Light in weight; easily adjustable and extremely accurate.

...Send for Literature on any or all Products...

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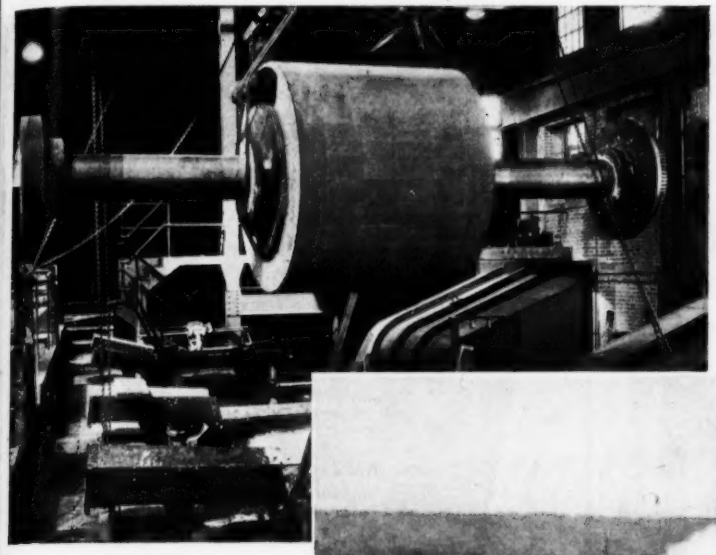

Going into ACTION/

an ALOXITE BRAND PULP GRINDING WHEEL

REG. U. S. PAT. OFF. AND CANADA

An Aloxite Brand Pulp Grinding Wheel ready to go into action in one of the twelve new grinders at the Great Northern Paper Company's plant at East Millinocket, Maine.

—A pulp grinding wheel destined to increase the production of high quality pulp at lowered grinding costs.

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Columbia Chain

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REX

Durobar

The advantages of combination chain for hauling pulpwood logs had long been recognized by the pulp mills. Thousands of feet were used annually despite the inherent fault in this chain, i. e., grinding of the forward barrel of the block link while passing over the sprocket.

Then the Chain Belt Company started selling Rex Durobar to this field. On a straight basis of performance, its use spread rapidly from mill to mill.

Rex Durobar is an improved combination chain. Metal has been added, off center to the pin, so that the forward barrel (the one that ground) never comes in contact with the sprocket. Bad sprocket action is ended. The life of the chain is immeasurably increased.

If you have never used Durobar, check it, and other Chain Belt Products that may interest you on the blank below and return to the Chain Belt Company.

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YOURS FOR THE ASKING

A complete library on the subject of slitting and roll-winding has been prepared by the Cameron Machine Company and any one or all of the following titles may be secured gratis.

THE CAUSE AND CURE FOR WELTS AND WRINKLES IN THE SURFACE OF ROLLS OF PAPER. This booklet is written with the object of assisting producers of rolls of paper to determine the cause of the welts and wrinkles often present in the surface of a roll of paper.

CAMACHINE MILL TYPE ROLL WINDERS is a complete catalogue of Cameron High Speed Winders for the entire range of requirements in modern paper and board mills.

A STUDY AND COMPARISON OF METHODS OF SLITTING AND WINDING ROLLS OF PAPER AND BOARD. For those interested in the production of rolls of paper, a brief but complete outline of the various methods of slitting and roll-winding have been described and compared in this booklet.

IMPORTANCE OF THE RIDING ROLLER IN SLITTING AND ROLL-WINDING MACHINES. The Riding Roller is an important feature of the modern winder and its value in the production of ideal news rolls and book paper rolls is discussed in this booklet.

SLITTING METHODS COMPARED deals especially with slitting methods rather than the various methods of roll-winding, as the various slitting methods have merits and demerits in themselves, independent of their relation to the combined process of slitting and roll-winding.

IMPORTANCE OF CORRECT LOCATION OF SLITTERS IN SLITTING AND ROLL-WINDING MACHINES. In this booklet the benefits to be derived from correct kind and location of slitting elements are contrasted with trouble due to errors in design of old style machines.

CAMERON MACHINE COMPANY
61 POPLAR ST. BROOKLYN, NEW YORK

★

Now

a stuff pump impeller

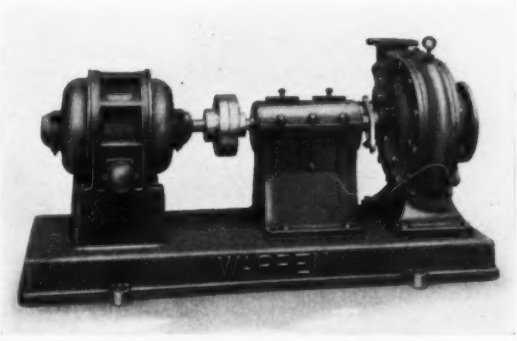
THAT WILL *NOT* BIND

Stock frequently works back of pump impellers, packs tight and binds the pump. Non-clogging pumps are no exception, are sometimes the worst offenders.

Shutdowns from this cause can now be eliminated. Warren engineers, after several years of experimental work and testing, have developed an impeller that is self-cleaning and non-binding.

Used in mills where stock handling conditions are known to be severe, Warren stuff pumps equipped with this type of impeller have given steady, dependable service for more than a year.

For non-clogging, non-binding stuff pumps to handle stock up to 6%, get in touch with Warren. Bulletins or estimates?



Warren Stuff Pump built to handle 6% clean stock smoothly, efficiently and without clogging or binding.

WARREN PUMPS

WARREN STEAM PUMP CO. *Incorporated*

WARREN, MASSACHUSETTS

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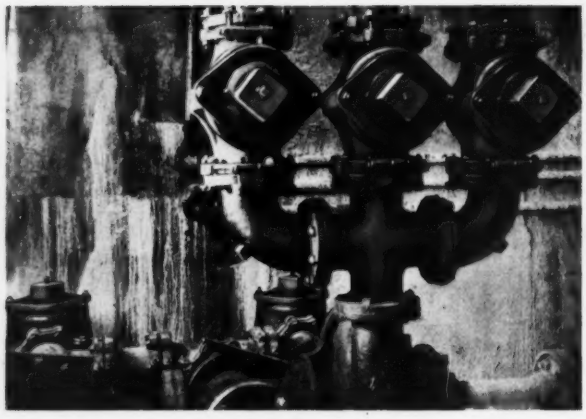


Duriron split-flanged pipe, fittings and cocks carrying hypochlorite bleach from make-up tank to beater.

NO TROUBLE from this corner

There's a whale of a lot of satisfaction in having one place that won't add to your worries. Down here, near the make-up tank, install Duriron pumps, valves, pipe and fittings for making up your bleach . . . with freedom from corrosion and contamination . . . without expensive and bothersome replacements.

Duriron recommends itself by its record. Wherever corrosive liquids are handled the superiority of Duriron is universally recognized. Why not cut your costs on handling bleach, the same as many other paper mills are doing?

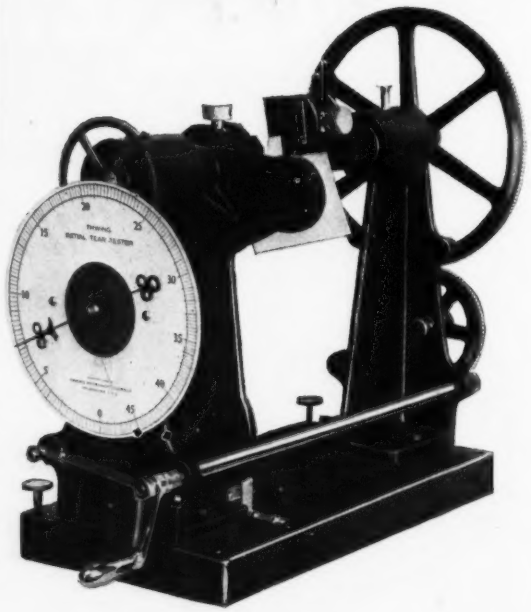
Our Engineers will gladly consult with you regarding the layout and equipment necessary and will give you an estimate on the cost.

THE DURIRON COMPANY, INC.

444 N. Findlay St. Dayton, Ohio

DURIRON

The Thwing Initial Tear Tester



For certain services, the value of paper depends on its resistance to the BEGINNING of a tear. Definite knowledge of this initial tearing strength assures the selection of materials that result in high quality paper products.

Thwing Initial Tear Testers are precision accurate instruments, built sturdily like machine tools. They are calibrated to read in pounds, the work required to start a tear. Readings are indicated directly on the instrument dial.

The Initial Tear Tester will test papers, and other materials covering a wide range of weights; i.e.:—insulating papers, news print, roofing felts, liner board, corrugated board, three ply box board, hard fibre, super-fibre board, etc.

The Thwing Initial Tear Tester should be in every testing laboratory.

ASK

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POWELL *MISCO* "C" VALVES

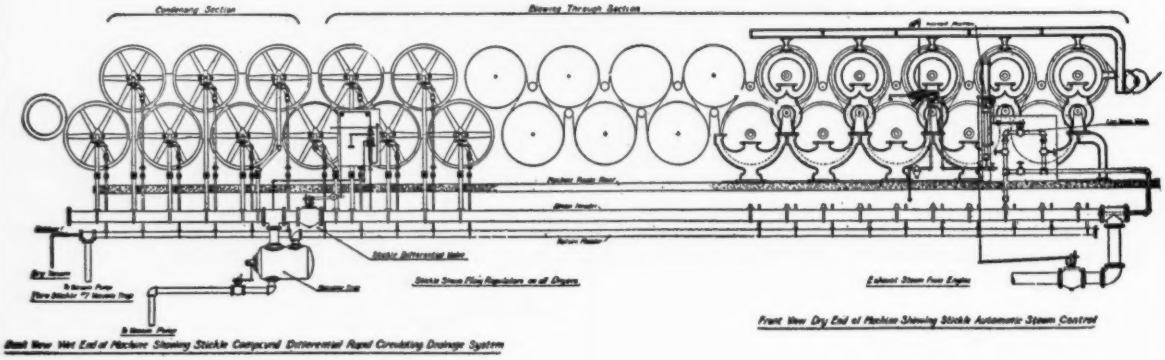
Part of a recent shipment of POWELL-MESCO "C" valves to a western sulphite mill. Included in this shipment were six 12" angle and six 8" swing check valves.

POWELL-MISCO "C" valves combine the experience of one of the world's pioneer makers of chromium-nickel alloys with that of one of the world's oldest and best known valve manufacturers. MISCO "C" valves, Powell designed and built, offer corrosion free operation month after month—year after year. For complete information regarding POWELL-MISCO "C" acid, relief, or blow-off valves write the Wm. Powell Co., Cincinnati, Ohio.

The story of MISCO "C" is told in Bulletin No. 5. Your copy will be mailed upon request.

MICHIGAN STEEL CASTING COMPANY
1990 GUOIN STREET, DETROIT, MICHIGAN

STICKLE'S SYSTEM OF DRYING PAPER



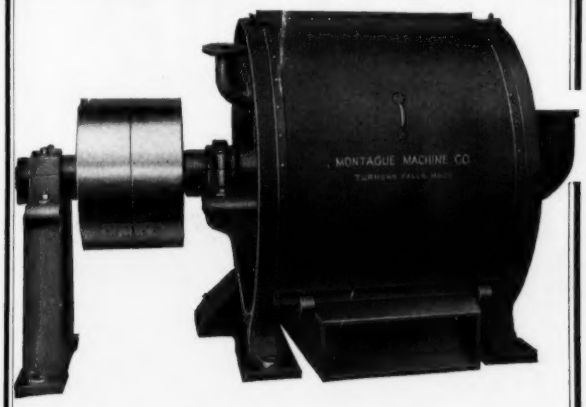
Back View Wet End of Machine Showing Stickle Compound Differential Rapid Circulating Drainage System

Front View Dry End of Machine Showing Stickle Automatic Steam Control

The Stickle Automatic Steam Control and Differential Rapid Circulating Drainage System will automatically maintain an evenly dried sheet at the lowest possible pressure at which a sheet of paper can be dried. The sheet will be held close to a one-half of one per cent moisture change.

Ask for Bulletin No. 18

STICKLE STEAM SPECIALTIES CO.
NEW YORK INDIANAPOLIS, IND.



The Montague Screen

Ten Points Worth While:—

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2—Rotor the only moving part.

3—Built either right or left hand.

4—Economical in first cost.

5—Low in maintenance cost.

6—Low power consumption per ton.

7—Large capacity of screened stock.

8—Quality of stock high and uniform.

9—Low percentage of rejections.

10—Rejections well washed.

They are all to be found in the Montague Screen

Montague Machine Co.

Turners Falls, Mass.

PAPER TRADE JOURNAL

ESTABLISHED 1872

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

SIXTY FIRST YEAR

Published Every Thursday by the

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CALENDER ROLLS
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Paper
•
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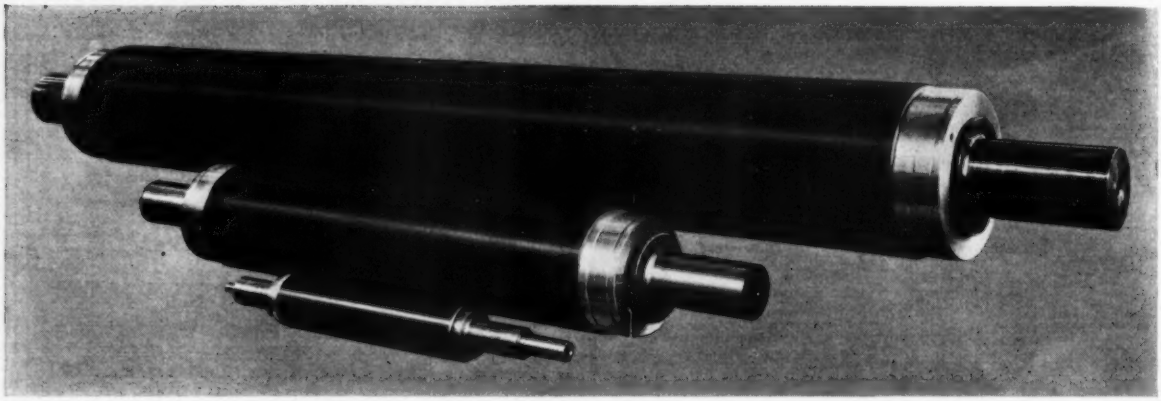

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THE APPLETON MACHINE COMPANY
Appleton, Wisconsin

ESTABLISHED IN 1872

PAPER TRADE JOURNAL

With Which Is Combined

Vol. XCV, No. 17 — PAPER — Thursday, October 27, 1932

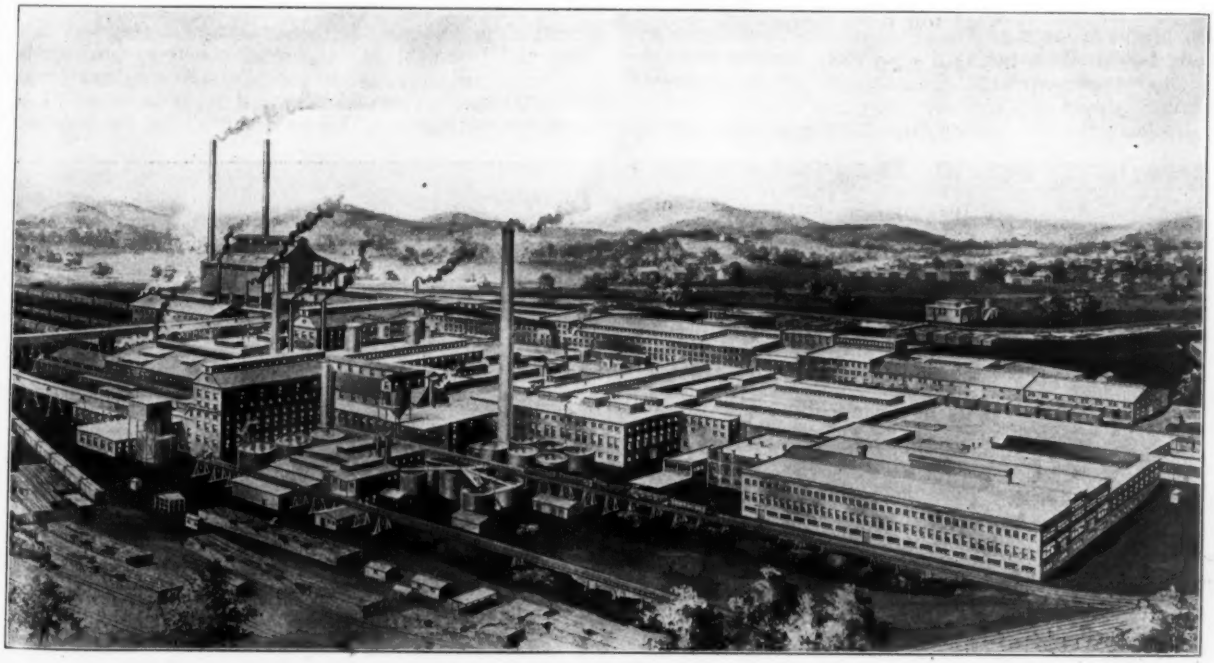
The Adjustment of a Southern Mill to the Changed Economic Conditions

Written Specially for the Mill Number

AT CANTON, North Carolina, in the heart of the Southern Appalachian Mountains, is located The Champion Fibre Company, one of the largest all process wood pulp producers in the United States. This company has recently come into added prominence by virtue of having completed the installation, in March of this year, of the largest paper machine ever erected for the making of the higher grades of white papers. This installation, together with its previous equipment of two fourdriniers and one cylinder board machine broadens the company's opportunity to use the pulp which it produces, thus lessening the amount which it has to offer on the depressed general market.

The Champion Fibre Company was organized in 1907 by the late Peter G. Thomson of Cincinnati, primarily for the purpose of supplying sulphite and soda pulp to his paper mill at Hamilton, Ohio. As originally designed, its plant included processes for the manufacture of sulphite pulp, soda pulp, container board and tannic acid. The principal determinant for its locating in Western North Carolina was proximity to a large supply of many varieties of woods.

The company's development from the beginning has been steady. It has included not only other processes for the manufacture of both pulp and paper but also for the production of by-products. These include the manufacture of sulphate and mechanical pulp, of soda bleach and caustic soda, the recovery of lime, the production of adhesive extract from sulphite liquors, and the manufacture of turpentine.



GENERAL VIEW OF THE PLANT OF THE CHAMPION FIBRE CO., CANTON, N. C.

STORAGE RESERVOIR ON PIGEON RIVER

The most interesting development however, is that which has been in the direction of enabling the company to convert more and more of its pulp into the finished product, paper. In 1921 the first fourdrinier machine, with a wire width of 168 inches, was erected by the Pusey & Jones Corporation, and in 1924 an additional duplicate machine was installed.

The depressed and dislocated pulp and paper market of recent years has prompted a further adjustment in the company's program. It became advisable for it to convert even more of its pulp into paper, and to this end it decided upon the installation of a modernized and large capacity paper machine. The decision having been made it was translated into action at the particular time because of a desire to take advantage of low costs of material and labor and, coincidently, to ameliorate the unemployment situation.

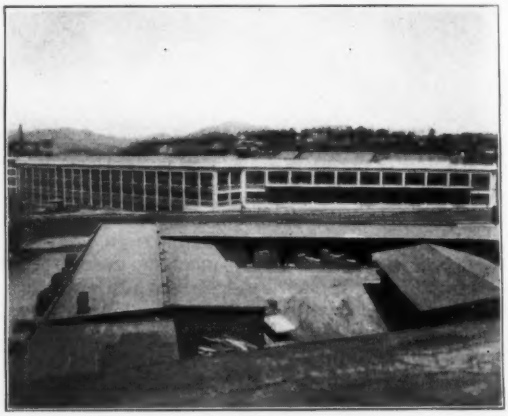
This undertaking is not viewed as an expansion program in that it does not mean the addition of any more paper to the total quantity on the market. It merely allows for the conversion of more of the company's unchanged production of pulp into paper at its own plant, thereby reducing the amount of pulp to be offered on the present depressed market.

The new machine is most interesting, not only from the standpoint of its size and refinements, but also from the standpoint of the speed with which its installation was accomplished. Paper was actually being produced within 146 days from the time when ground was broken for the foundation of the necessary buildings to house the machine and its auxiliary equipment. This is believed to be a record for installation of a paper machine of such magnitude.

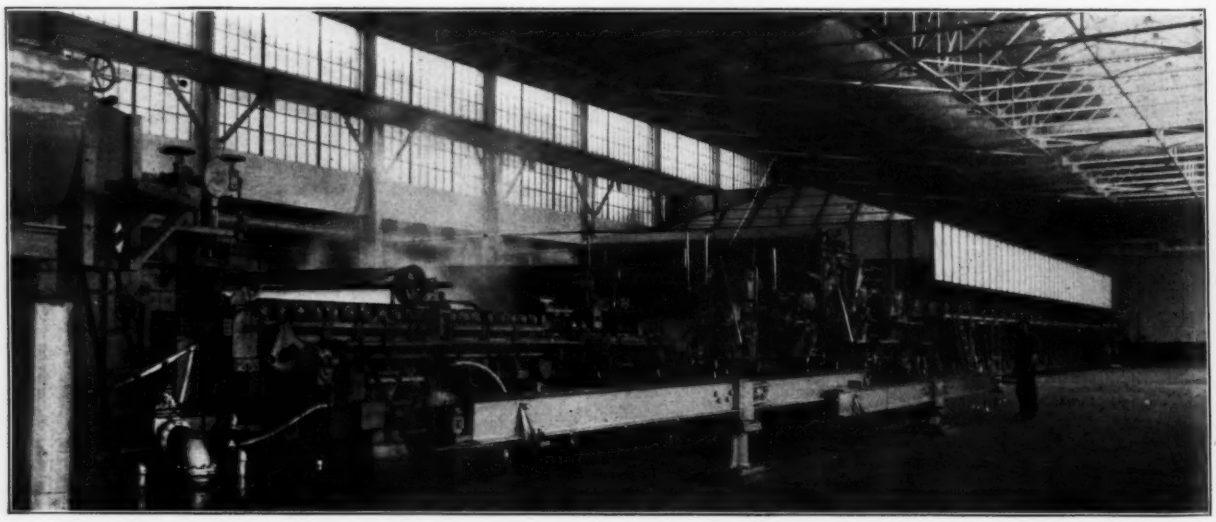
The project involved the construction of three new structures adjacent to the existing buildings. They cover a ground area of 66,300 square feet, affording a total of 157,700 square feet of additional working floor space with a total building volume of 3,392,000 cubic feet.

Machine Room Extension

The Beater Room extension is 54 feet long and 120 feet wide, three story and basement of reinforced concrete construction covering a ground area of 65,000 square feet and affording 26,000 square feet of working floor space. The Machine Room is 352 feet long and 110 feet wide, one story and basement of reinforced concrete construction with structural steel superstructure covering a ground area of 38,700 square feet and affording 68,500 square feet of working floor space. The main portion of the machine



SOUTHSIDE VIEW OF NEW FINISHING ROOM

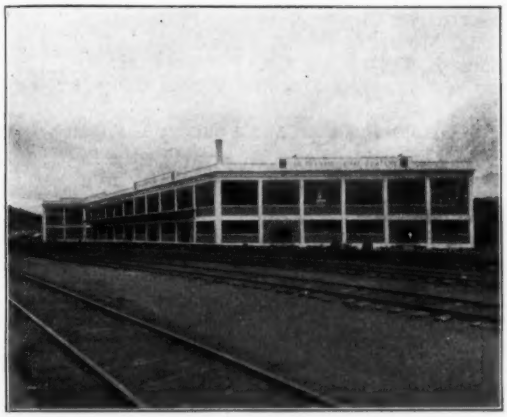


GENERAL VIEW OF NEW 246-INCH PUSEY & JONES FOURDRINIER.

room building is sufficiently wide to provide for a possible future installation of another large paper machine, duplicate in size to the one that has just been installed.

The Finishing Room extensions consist of two additional areas added to the east and south sides of the existing building covering a ground area of 21,000 square feet and affording 63,200 square feet of additional working floor space for the finishing of the product of the book mill. Considerable additional storage space and increased shipping facilities are also afforded in these extensions. The structure is two story and basement of reinforced concrete construction with structural steel superstructure. The easterly extension is 108 feet long, 208 feet wide on its westerly side and 125 feet wide on the easterly side. The southerly extension is triangular in shape 67 feet wide at the easterly end of the machine room and 90 feet long.

The exterior appearance of these building extensions with their concrete frame work, red brick wall filling, large steel sash and a plain well proportioned concrete parapet and cornice present a generally attractive addition to the mill.



FINISHING AND SHIPPING ROOM BUILDING

On the main floor in the beater room extension there has been installed six new "Dilts" 2000 lb. beaters, and six "Jones" Majestic jordans which, with a filter type thickener and screw conveyor system on the floor above supplying individual measuring tanks over each beater and four horizontal, tile lined concrete chests, in the basement provide for the preparation of stock for the new machine. The top floor of this building affords considerable additional storage space for pulp.

REAR OF MACHINE BUILDING

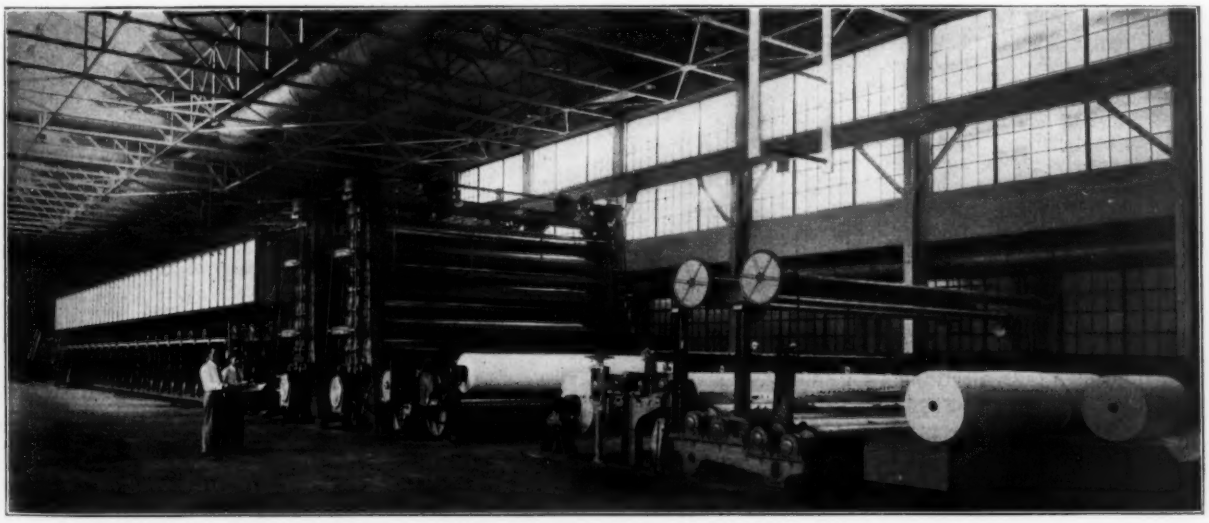
In the new machine room, a substantial reinforced concrete column and beam structure with tile lined pits at the wet end of the machine support the splendid new paper machine manufactured and erected by the Pusey & Jones Corporation, of Wilmington, Delaware. Ahead of this machine are five "Moore and White," twenty-four plate rotary screens and one twelve plate flat screen.

The New Paper Machine

The abridged specifications of the new paper machine with the exception of a few special features are as follows:

Head box of cypress, copper lined in combination with a Voith stock inlet.

Fourdrinier part arranged for wire 85 feet long, 242 inches wide with 36 inch diameter suction couch roll with cantilever attachment, 7 flat suction boxes having motor driven oscillating device, 10 inch diameter table rolls, 26 inch diameter breast roll, removable type wire handling arrangement, with high speed shake and adjustable pitch



DRY END OF NEW 246-INCH PUSEY & JONES FOURDRINIER

device, all rolls on antifriction bearings with improved mountings.

Press part with three 32 inch diameter rubber covered lower press rolls and 28 inch diameter upper stone rolls, the third press arranged with reversed felt. One set of smoothing rolls is mounted on the end of the drier frame next the third press for removing any wire and felt marks before they are indelibly dried into the paper. These rolls are interchangeable with the press rolls. Sheahan patent rope carrier for threading paper through the third press and smoothing press. All paper and felt carrying rolls, also main press rolls equipped with anti-friction bearings with improved mountings.

Dry part comprising forty 60 inch diameter drying cylinders, six 48 inch diameter felt driers, 16 inch felt rolls, Sheahan rope carrier for feeding paper, gravity feed lubrication system for main drier bearings, all bearings of anti-friction type, driers all geared together in one section driven by four motors. The housing and driving of the drying cylinders on the back side involving an improved arrangement of small gearing enclosed in the frames, equipped with anti-friction bearings and arranged for continuous lubrication, insures safety for the operators and permits more open spaces between drier cylinders for the removal of paper broke by means of air from the back side.

Two stacks of calenders, the first containing 7 rolls and the second 9 rolls of 20 inch diameter top, 18 inch diameter intermediate, 20 inch diameter next bottom, and 34 inch diameter bottom rolls equipped with flexible ductors.

Improved type two drum uniform speed reel with 42 inch diameter driving drum, also improved unwinding stand with water cooled friction arrangement, all equipped with anti-friction bearings.

All running parts constructed and tested suitable for a minimum operating speed of 75 feet per minute and a maximum speed of 1050 feet per minute which can be obtained by means of a General Electric Company sectionalized electric drive of the latest type.

A "Moore and White" four drum winder with individual motor drive completes the equipment necessary to produce fine grades of paper in quality and sizes to meet any exacting demands of a customer's specifications.

Complete Heating and Ventilating System

The drier part of the machine is covered with a panel type transite hood with exhaust fans to the atmosphere and particular attention has been given to the heating and ventilation of the new plant extension.

The complete Heating and Ventilating System was designed and furnished by the J. O. Ross Engineering Corporation, as consisting of a conventional roof supply system, all supply air being taken direct from out doors through heating apparatus located above the paper machine drives. A suitable quantity of air is discharged into the ends of the machine room basement.

The Paper Machine Hood is of the Ross removable panel construction, built of Transite and steel. It is noteable for having a wide overhang, allowing for easy access to the machine by means of walk ways on both front and back sides inside the hood curtains. Hood exhaust is handled through fans, affording a constant and controllable exhaust volume.

In the basement of the machine room are located the control room and motor generator set for the paper machine electric drive; the necessary vacuum stock and water pumps, broke beater, principal piping and all auxilliary equipment necessary for the complete and satisfactory operation for the new paper machine.

This equipment permits the production of a very wide range of papers and boards, such an envelope, bond, book, tablet, manila, waxing, postcard, foil, kraft, papeterie, cover, ledger, pressboard, tag, index, bag, wrapping, etc.

A list of the principal equipment in the new mill and the concerns from which it was purchased follows:

Construction managers, The Morton C. Tuttle Company, Boston, Mass.

Paper machine, Pusey & Jones Corporation, Wilmington, Del.

Structural steel, Ingalls Iron Works, Birmingham, Ala.

Steel erection, The Steel Construction Company, Birmingham, Ala.

Concrete piles, Raymond Concrete Pile Company.

Cement, Cumberland Portland Cement Company, Cowan, Tenn.

Reinforcing steel, Wilson, Weesner & Wilkinson, Knoxville, Tenn.

Paper machine drive, General Electric Company.

Winder drive, Moore & White, Philadelphia.

Screens, Moore & White, Philadelphia.

Jordans, E. D. Jones & Co., Pittsfield, Mass.

Broke beaters, Dilts Machine Works Company, Fulton, N. Y.

Filters, Glamorgan Pipe and Foundry Company, Lynchburg, Va.

Vapor circulating system, Midwest-Fulton Machine Company, Dayton, Ohio.

Roll grinder, Farrell Birmingham Company, Ansonia, Conn.

Switch gear, motors and controls, Westinghouse Electric and Manufacturing Company.

Sprinkler system, Grinnell Company, Providence, R. I.

Pumps, Allis Chalmers Manufacturing Company.

Conveyors, Bailey-Burress Manufacturing Company, Atlanta, Ga.

Temperature recorders, The Foxboro Company, Foxboro, Mass.

Wire and cable, American Steel and Wire Company, Atlanta, Ga.

Heating and ventilating, J. O. Ross Engineering Company, New York.

20 ton electric crane, Shepard-Niles Crane and Hoist Company, Philadelphia, Pa.

Sash, Detroit Steel Products Company.

Roofing and laying, W. H. Arthur Company, Asheville, N. C.

Agitating units, The Noble & Wood Machine Company, Hoosick Falls, N. Y.

Valves, Hajoca Corporation, 120 South 30th street, Philadelphia, Pa.

Stuff pumps, Shartle Bros. Machine Company.

Flat screen, Sandy Hill Iron and Brass Works, Hudson Falls, N. Y.

Cone bottom tanks, Chattanooga Boiler and Tank Company.

Drives, Morse Chain Company, Ithaca.

Plumbing supplies, Crane Company, Chicago, Ill.

Pipe lines, Michigan Pipe Company, Bay City, Mich.

Multipanel filter, American Air Filter Company, Louisville, Ky.

Superintendents to Meet at Richmond

RICHMOND, Va., October 20, 1932—The meeting of the Southeastern Division of the American Pulp and Paper Mill Superintendents Association, scheduled for Friday and Saturday, November 11 and 12, will be held at the William Byrd Hotel, instead of the Ruegers Hotel, as previously announced.

Hawaii's New Insulation Board Plant Possesses Many Advantages

By W. F. Goldsmith[1]

FORMAL opening at Hilo, Hawaii, on April 27, of the mill of Hawaiian Cane Products, Ltd., for the manufacture of "Canec"—cane fiber structural insulation—marked the inauguration of an important new enterprise for Hawaii and a step further in the utilization of what has been, in part at least, a waste product of the sugar industry. The project represents an investment in excess of $2,000,000, will provide employment for 150 to 200 workmen, and will produce annually 100,000,000 square feet of building material. The importance of the undertaking was recognized by the presence at the opening of a large gathering of business men and by receipt of a long distance telephone message from Secretary of Commerce Lamont in which he hailed it as an example of American business initiative particularly needed at this time.

The preliminary work which has led up to the establishment of the new industry was started several years ago through an investigation conducted by a committee of the Hawaiian Sugar Planters' Association. It was carried forward by a company called Hawaiian Cellulose, Ltd., which was replaced in 1930 by Hawaiian Cane Products, Ltd., in which leading business men of the territory, including sugar factories controlling 95 per cent of the sugar crop, are represented.

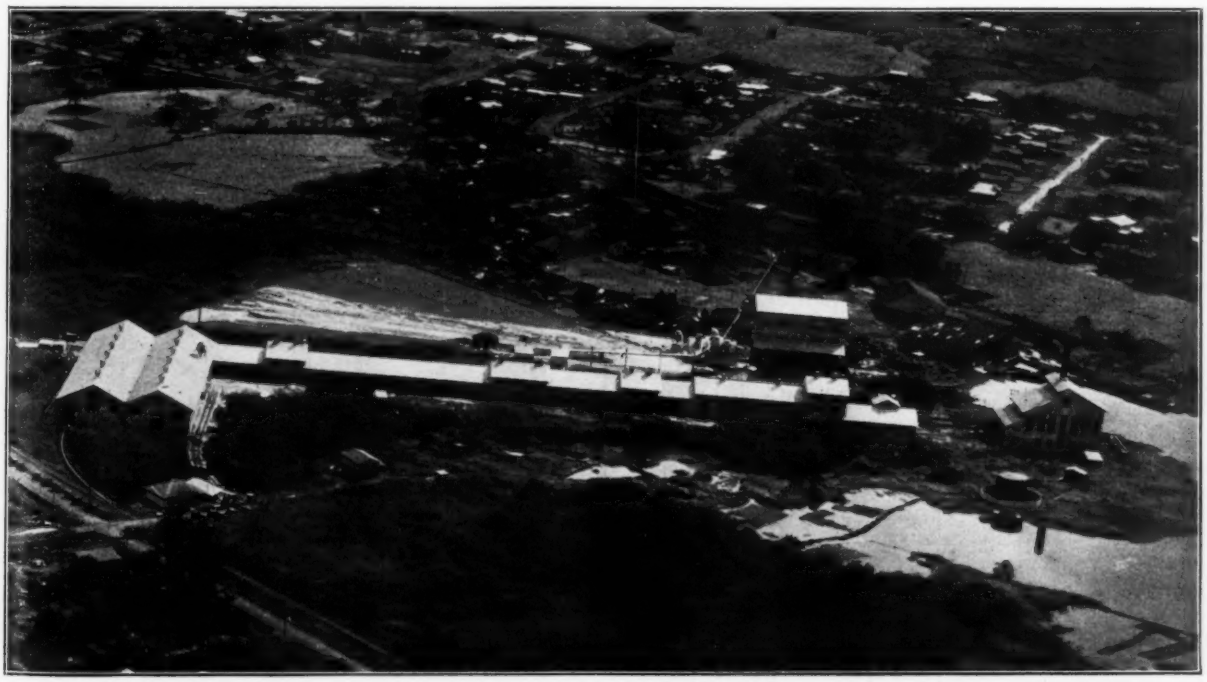
After an extensive engineering and economic survey the construction of the plant was begun early in 1931 and it was completed in November of that year. The design of the plant and the supervision of its construction was placed in the hands of the Honolulu Iron Works Company, while the contract for its equipment was awarded to the United States Machinery Company. Products which the mill is equipped to turn out include structural insulation board in sizes 4 feet wide by 6 to 12 feet long, structural insulation lath in sizes 16 inches by 32 inches and 18 inches by 48 inches, insulation tile for interior decoration, and special low density refrigeration and roof insulation. For local use in the Hawaiian Islands the company will make an especially strong board which will be offered as a direct substitute for certain types of lumber.

[1] Technical Director, Hawaiian Cane Products, Ltd., Honolulu, T. H.

Manufacturing Process

The principal raw materials used in the manufacture of cane fiber structural insulations are bagasse, lime, rosin size, and alum. At full production the Hilo plant will consume approximately 10 per cent of the total available bagasse supply in the Islands. The bagasse comes from the Waiakea Mill Company, Hilo Sugar Company, and Olaa Sugar Company; roughly 30,000 tons from Waiakea, 45,000 tons from Hilo Sugar Company, and 15,000 tons from Olaa. Proximity of these sugar mills permits quick delivery of bagasse and eliminates necessity of storage at the Canec mill.

The bagasse as delivered to the board mill is roughly 55 per cent bone dry. It is screened as it arrives from the sugar mills, the fine material or pith being discarded and the remainder separated into two sizes which are called coarse and fines. Any excess over that required for daily



AIRPLANE VIEW OF NEW PLANT OF HAWAIIAN CANE PRODUCTS LTD.

operation passes along a conveyor dropping into a pile at the apex of a triangular storage yard, from which the bagasse is hauled to storage by an eight-yard Sauerman drag-line bucket. Reclaiming from storage is only necessary when one or more of the sugar mills is not shipping in bagasse. This is accomplished by reversing the Sauerman bucket, thus drawing in material to a hopper from which a return conveyor delivers it again above the screens from which it follows through the same steps as outlined above. Rescreening requires no additional equipment since the same screens are used for receiving incoming bagasse and for rescreening stored bagasse. This method of handling obviates the necessity of storing all bagasse as it arrives, thus decreasing handling charges and preventing the possibility of deterioration of the quality of the bagasse through long storage.

Rotex screens are used for screening the bagasse and from this point on, the two portions of bagasse, representing fibers of considerably different lengths, are handled entirely separately, both being worked in parallel and the coarse stock undergoing throughout a somewhat more drastic treatment than the fine material. The two types of stock are brought together at the forming machine. Handling in this way, the operators have considerable leeway in adjusting the quality of the stock before it actually goes to the forming machine, thus minimizing the chances for production of off-grade material.

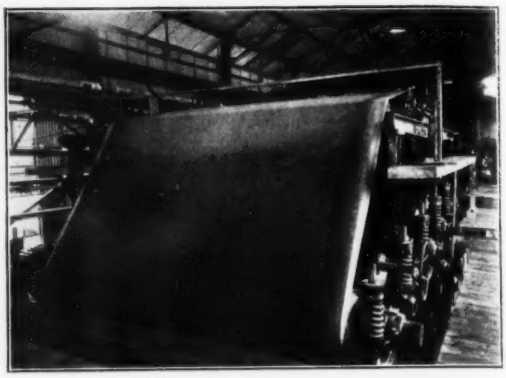
Cooking

14-foot Globe rotary digesters are used for cooking, all possible labor saving devices being employed to speed the work of charging and discharging. The bagasse is cooked at a temperature equivalent to 60 pounds pressure for a period of aproximately three hours. After cooking the digesters are dumped into bins below, from which the pulp is handled by a belt conveyor to the drain bins.

Two drain bins, each with a capacity of twelve hours' storage, are provided, one for coarse and one for fine stock. These bins have perforated bottoms, permitting the cooking liquor to drain away to the sewer. Ageing softens the stock and makes it more pliable. It also permits later refining with minimum power consumption.

Refining

From the drain bins the pulp is conveyed mechanically over magnetic separators to remove any metal which may have been received with the raw material or picked up in process. Bauer refiners are used for refining and the system is laid out so that each Bauer may be fed with coarse or fine pulp. The Bauers discharge from the bottom to either of two troughs, which flow to separate tanks where the stock is diluted with water to about one per cent consistency.



DOWNINGTOWN PRESS

From these tanks the fine pulp is pumped to an Oliver thickener which serves to wash out any residual lime and soluble products formed during cooking, and also to thicken the pulp. The coarser pulp is similarly treated in a two-stage Improved Paper Machinery Company washer.

The washed and thickened pulp is conveyed to four 14 by 40 foot horizontal cylindrical stock chests each provided with agitators, the coarse and fines being still kept separate. Rosin size in the form of an emulsion is added to each grade of stock in the storage chests.

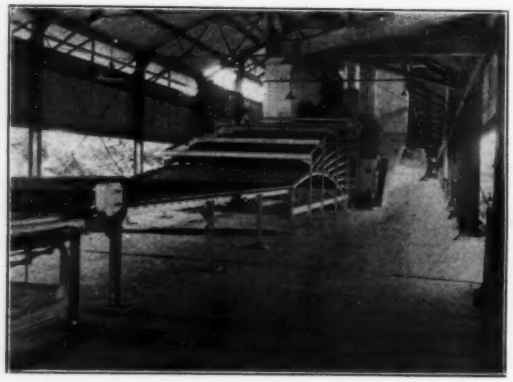
Mixing and Board Formation

From the stock chests the two types of stock are drawn by gravity to Claflin refiners which serve to complete the pulping action. In effect they afford the operator a final control before passing to the board machine. The Claflins throw the pulp up to a mixing tank which is provided with an agitator and in which the fine and coarse pulps are combined in the proper proportions. White water removed by the forming machine, containing a small amount of fiber, is added to lower the consistency to approximately 0.75 per cent. This high dilution permits thorough interlacing and cross graining of the fibers.

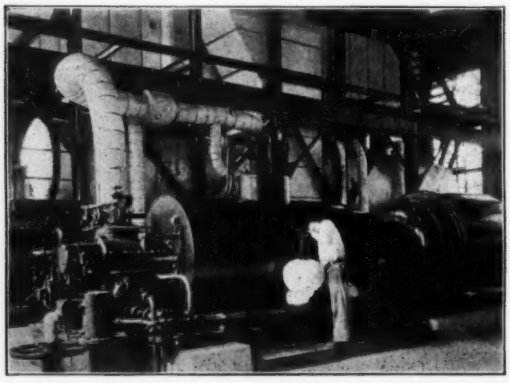
From the mixing tank the diluted pulp flows to the head box of the Oliver board machine, a vacuum type machine of relatively simple construction, which makes possible the manufacture of boards up to one inch thickness without laminating.

Pressing and Drying

Leaving the Oliver machine, the board passes through a Downingtown press equipped with five pairs of rubber covered rolls. Before entering the eight-deck Coe drier



CANE EMERGING FROM DRIER



VIEW OF POWER PLANT SHOWING TURBINE

390 feet long, a Coe wet saw cuts the board into suitable lengths ranging from 6 to 12 feet. The machine operates by means of a high speed saw traveling at right angles to the direction of the board. Passing out of the drier the board is again subjected to sawing which trims the large units to suitable sizes for wrapping and shipping.

Location

The location of the plant, close to deep water, gives it the advantage of low transportation rates for the movement of its products to the mainland and foreign countries, while a considerable market is assured in Hawaii itself. Orders for several million feet of board were placed within a few weeks after the opening of the mill.

Officers and Directors

The officers of Hawaiian Cane Products, Ltd., are J. E. Russell, president; W. F. Dillingham, vice-president; W. L. S. Williams, vice-president in charge of operations; C. V. Bennett, vice-president in charge of sales; C. J. Henderson treasurer; H. Edmondson, secretary. The board of directors includes J. E. Russell, president Theo. H. Davies & Co., Ltd.; W. F. Dillingham, president Oahu Railway and Land Company; A. W. Bottomley, president American Factors, Ltd.; J. Waterhouse, president Alexander & Baldwin, Ltd., F. C. Atherton, president Castle & Cooke, Ltd., H. Johnson, vice-president C. Brewer & Co., Ltd.; R. W. Atkinson, vice-president Hawaiian Dredging Company, Ltd.; W. L. S. Williams, manager Waiakea Mill Company; G. H. Angus, vice-president Theo. H. Davies & Co., Ltd.

Theo. H. Davies & Co., Ltd., a leading sugar factor and merchandising house since 1845, with headquarters in Honolulu and offices in San Francisco and New York, act as managing agents for the new enterprise.

Special Application for Motor Driven Grinders at Manistique Mill

By Edward Sheahan[1]

MANISTIQUE Pulp and Paper Company, Manistique, Michigan, entered into an agreement last Fall to purchase electricity from the Edison Sault Electric Company to cover its requirements for miscellaneous power and also to furnish power for two of their water wheel driven magazine pulp grinders. These two grinders are driven by synchronous motors in periods of water shortage, at which time the water wheels are disconnected from the grinder shafts.

In addition, the township utility load being supplied by the paper mill through its subsidiary, the Manistique Power and Light Company, was taken over by the Edison Sault System to be served from the hydro generating plant at Sault Ste. Marie, Michigan, through a transmission net work linking Manistique with St. Ignace and the Sault.

The paper mill has been generating its own electric power at 2300 volts from a 1250 KVA hydro generator and a 3125 KVA steam turbo generator arranged for parallel operation. Two step-down banks of power transformers of 900 KVA capacity served small motors at 440 volts, and another transformer bank of about 60 KVA capacity served the lighting system.

The township of Manistique was served with 2300 volt current from the mill generators, the current being stepped down for lighting, etc. at distributing centers in the usual manner.

Unique Features

Three features of the Edison Sault Electric Company's System as a whole put it to some extent in a class by itself:

(1) the relatively small generating capacity of the system, substantially 5000 KW. at Unity Power Factor.

(2) the unusual total length of 66 KV transmission line for a system of this size, namely 112 miles.

(3) the relatively large motors served at the far end of the system, i. e., two of 1250 HP each, consuming about 40 per cent of the maximum output of the system.

In order that all customers may receive service of good quality, it was necessary for the Edison Sault Company to impose unusually severe requirements on the motors in the paper and pulp mill.

[1] Manager of Manistique Pulp & Paper Co., Manistique, Mich.

To obtain satisfactory voltage regulation at the Manistique end, where an outdoor type substation was provided to control the Manistique utility load, as well as the paper and pulp mill load, it was necessary to provide automatic equipment comprising a 1000 KVA shunt reactor and a 1000 KVA synchronous condenser with automatic voltage regulator, functioning together as a unit in such manner as to provide voltage regulation at the receiving end of the line and power factor correction at the sending end of the line.

In order to have a maximum supply of power, it was obviously desirable that Edison Sault be able to operate its system at all times as closely as possible to unity power factor at the Sault generating station.

By the same token, in order to avail itself of the advantages accruing from unity power factor operation, and because of certain penalties in the contract for operation below that value, it became evident to the paper mill that it would be to its advantage to provide grinder motors designed for leading power factor, which, when combined with the operation of the paper mill load, would practically assure plant operation at unity power factor.

Degree of Control

In this manner the desire of the power company to have some degree of control over power factor of total mill load due to its large proportion of the system capacity, and the desire of the paper mill to operate at unity power factor, were satisfied.

Toward that end, two 1250 H.P. synchronous motors at .90 leading power factor, were provided, which together with the paper mill induction motor lead, gave a resultant operation at unity power factor, at a slight additional cost for the grinder motor over unity power factor motors.

One of the most important considerations from the standpoint of the power company was the problem of how to start these two grinder motors without too much disturbance of voltage regulation. The power company had given this a good deal of study before the paper company called in its consulting engineer.

The only method the power company was able to devise for keeping voltage dips on their system within satisfactory limits, without resorting to the use of untried

equipment for motor applications of this size, was to use a standard type of synchronous motor with shaft free starting at reduced voltage, and a magnetic clutch for coupling the motor shaft to the grinder shaft.

By this means the power company claimed that the grinders could be started easily and gradually by means of the magnetic clutch under automatic control, extended over a sufficient interval of time so that the automatic voltage regulators at the Sault hydro station and also the automatic voltage regulator in the Manistique substation would prevent any noticeable fluctuation in service voltage during the starting interval of each of the two motor driven grinders.

Satisfactory Regulation

The attainment of this result would obviously be of considerable advantage to the electric service on the system especially when one of the motor driven grinders is in operation, while the second motor driven grinder is being started, since this would insure good stability, as well as satisfactory regulation.

It is to be noted that flexible couplings are used in place of the magnetic clutches recommended by the power company.

The stipulations laid down by the power company around which much discussion revolved before the type of equipment was finally agreed upon and purchased, was that in starting a grinder motor, the instantaneous inrush must not exceed 375 KVA at any step in the starting cycle; that the maximum inrush must not exceed 1500 KVA; that the starting cycle must not exceed four steps; that the time between steps must average three seconds; that the KVA change at the moment of synchronization must not exceed 375 KVA.

Other technical requirements were imposed upon the design of the grinder motors to guard against possible interference with telephone service, overloading of motors due to unusual jamming of wood in grinder magazine, overheating of motor due to inability to start grinders, and others.

Another stipulation was that the grinders were to be equipped with regulators capable of controlling operation to such an extent as to limit load fluctuations to 250 KW per second during the grinding cycle.

Equipment

After thorough deliberation of the various proposals received, and in full agreement with the power company, orders were placed for the following equipment:

Four 1250 KVA single phase, 66000/2300 volt oil immersed self-cooled outdoor transformers, one being a spare, (Allis Chalmers).

One high tension outdoor substation consisting of galvanized steel framework on concrete piers, 69000 volt and 7500 volt switch equipment, bus structure and accessories, (Railway and Industrial Engineering Company).

One indoor type substation containing the reactor, the synchronous condenser and the control board, (General Electric Company).

One 3000 ampere, 2300 volt pole line, connecting substation and mill over a distance of 700 feet, with 600 ampere, 2300 volt emergency line for outgoing power from mill generators, (Manistique Pulp and Paper Company).

One switchboard equipment for the Mill, to control incoming and emergency outgoing power, (General Electric Company).

Two 1250 H.P., .90 leading power factor, 3 phase, 2300 volt synchronous motors, direct coupled to grinder shafts, with motor operated field rheostats, full automatic special part winding, auto transformer, synchronous motor control panel, relay panel, paralleling breakers and motor generator exciter set, (Electric Machinery Company).

Two flexible couplings for connecting motor shafts to grinder shafts, (Waterous, Ltd.).

Two hydraulically actuated grinder load regulators, and one electrically actuated master regulator, (Meyer Governor Company).

Installation Completed

The installation was completed during the past summer and one of the two motor driven grinders has been in operation since August 1. The second motor driven grinder is no doubt, in service at the time this article is written.

The results have shown that in the majority of instances, the magazine grinder starts on the third step of the motor control, but owing to the dissimilarity of operation when compared with water wheel drive, it has taken some time for the grinder men to accustom themselves to the change.

The immediate supervision of the work described herein, was in the hands of Edward Sheahan, manager of the Manistique mill, the engineering design being by George F. Hardy, whose representative, H. L. Watson, was resident engineer, in charge of the field work.

Bogalusa Paper Co. Improves Plant

The Bogalusa Paper Company, Bogalusa, Louisiana, has purchased a 7,500 kv-a. turbo generator from the Westinghouse Electric and Manufacturing Company as a part of their program of $1,250,000 for improvements and new equipment.

The owners of the property are proceeding with the improvements to effect economies in manufacture, to conserve natural resources, and to do their part to stimulate business. The plant is operating at full capacity and has been all year. It manufactures kraft wrapping and bag papers, container board and specialties.

The improvements will be completed within six months and include new and original designs which are a departure from regular sulphate mill practice. The United Engineers and Constructors, Inc., of Philadelphia, have been retained as consulting engineers. A. Suter, general superintendent, under the direction of M. E. Cody, general manager, is in charge of the improvements.

New Blower System for Corinth Mill

[FROM OUR REGULAR CORRESPONDENT]

CORINTH, N. Y., October 22, 1932.—A new blower system is being installed at the local branch of the International Paper Company for the purpose of eliminating dust from raw materials used in the manufacture of paper. The new system is being placed near the boiler house where it will accomplish best results. Increased production has resulted in the recall of about 75 workers and further enlargement of the force may be necessary in the near future. It is estimated that the improvements now under way at the plant will cost about $100,000.

Sauquoit Paper Mill Speeds Output

[FROM OUR REGULAR CORRESPONDENT]

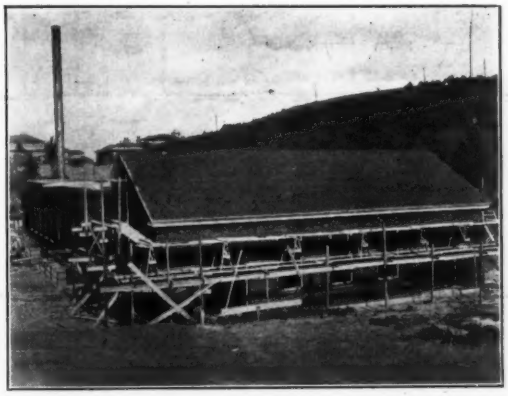
UTICA, N. Y., October 22, 1932—Increased production has been under way at the mill of the Sauquoit Paper Company for some time past and officials report that the business being experienced this year is better than at any time since the recent war. The volume of orders received has resulted in the adoption of additional shifts and it is probable that an enlargement of the working force will be necessary. Indications are that the present schedules will be in effect for the remainder of the year at least.

New Paper Laboratory at New York State College of Forestry Nears Completion

By C. E. Libby[1]

THE NEW $50,000 semi-commercial pulp and paper laboratory building being erected at the New York State College of Forestry, Syracuse, N. Y., is nearing completion. It is expected that the building will be occupied by the Department of Pulp and Paper Manufacture at the college before January 1.

This new building will provide greatly enlarged facilities for the faculty and students of this department of the college, which has experienced rapid growth and popularity during the past few years under the leadership of Dr. Hugh P. Baker, formerly secretary of the American Paper and Pulp Association, and now Dean of the College.



NEW LABORATORY UNDER CONSTRUCTION

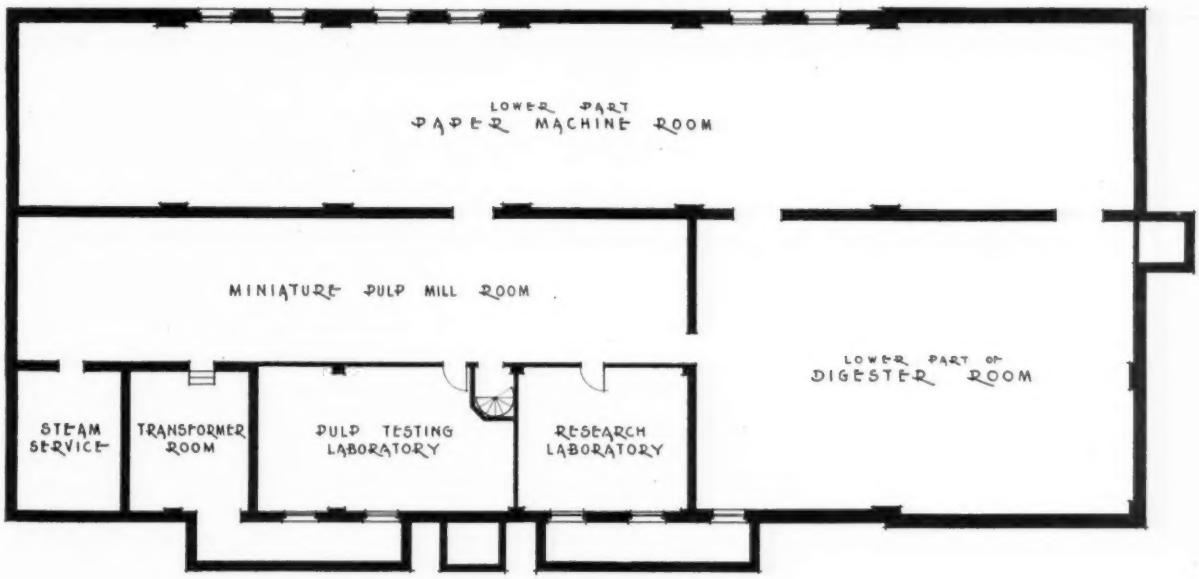
Equipment of Laboratory

The new laboratory is a substantial factory type brick structure, 140 feet long by 62 feet wide, containing in one story and basement approximately 18,000 square feet of floor space. The greater portion of the space in the building will be devoted to semi-commercial wood pulping equipment and to a small combination Fourdrinier and cylinder paper machine which will occupy the entire east side of the building. The building will also contain a large chemical laboratory, a color laboratory, and a paper testing laboratory equipped with constant humidity and temperature control. One section will be devoted exclusively to small scale laboratory pulping and refining equipment. There will also be a pulp-testing laboratory, a research laboratory, stock rooms and offices.

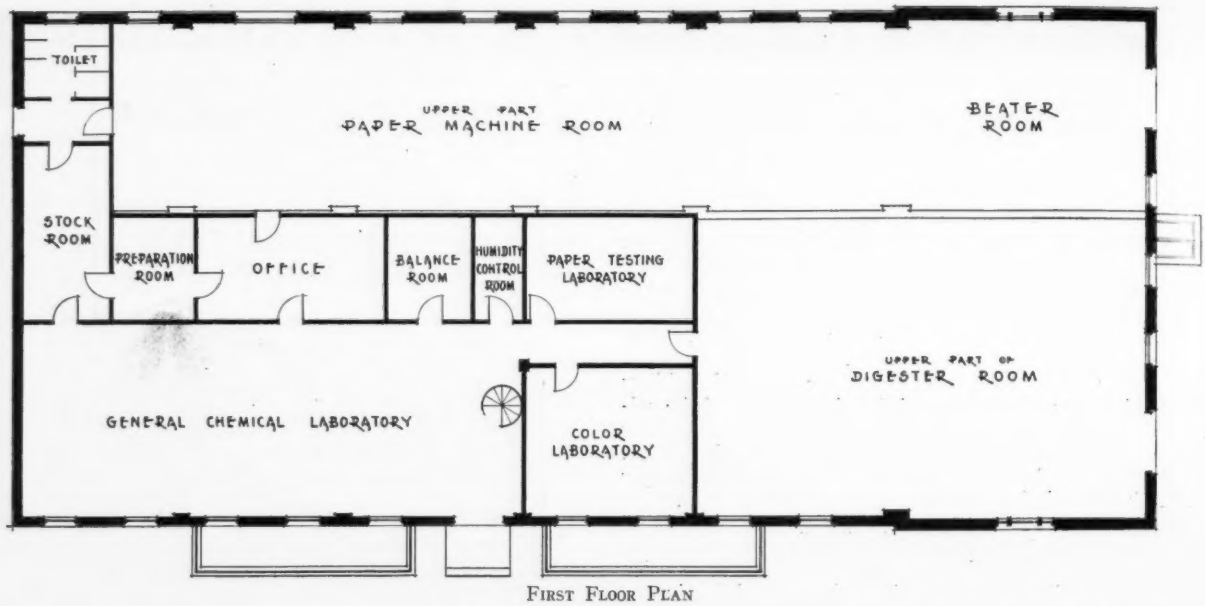
The semi-commercial digester room will contain digesters for manufacturing pulp by the various chemical processes and the digesters will be of a size to produce from 200 to 300 pounds of chemical pulp from a single cook. It is also proposed to install a small wood pulp grinder for manufacturing mechanical pulps. Necessary wood preparing equipment will be installed, including barkers, chippers and chip screens. The digester room will also be furnished with equipment for manufacturing sulphite acid, soda and sulphate cooking liquors, and bleach liquors.

The paper machine room will contain pulp beaters and refining engines and a 30 inch combination Fourdrinier and Cylinder paper machine. It is proposed to equip the cylinder part of the paper machine which will be located in the basement of the building, under the Fourdrinier part with five cylinder vats to enable the college to experiment with the manufacture of the various types of

[1] Professor of Pulp and Paper Manufacture, New York State College of Forestry, Syracuse, N. Y.



BASEMENT FLOOR PLAN



FIRST FLOOR PLAN

paper boards which are of particular interest to the paper industry in New York State because of the large number of paper board mills in the State.

Personnel Changes

The teaching staff of the Department of Forest Chemistry at the College of Forestry which formerly sponsored the pulp and paper work was recently reorganized due to the resignation because of ill health of Dr. Louis E. Wise, head of the Department. Dr. Wise has been made Emeritus Professor of Forest Chemistry and will continue to advise the College staff in the field of cellulose chemistry, in which he is an internationally recognized authority.

Prof. Libby Head of Department

At a recent meeting of the Board of Trustees of the College of which former Governor Alfred E. Smith is president, the name of the Department of Forest Chemistry was changed to the Department of Pulp and Paper Manufacture and Professor C. E. Libby who has been in charge of the pulp and paper course since its establishment in 1920 was made head of the new department. It was felt that this was a logical move since more than 90 per cent of the students in the department of forest Chemistry in recent classes have been going into the paper industry on graduation.

F. C. Peterson, Assistant Professor

The work of the college in the field of cellulose and wood chemistry will be continued under the direction of the Department of Pulp and Paper Manufacture and F. C. Peterson, formerly instructor in pulp and paper manufacture, has been advanced to the position of assistant professor of forest chemistry. He will be in active charge of this work. The position of instructor in pulp and paper manufacture has been filled by Howard Morgan, a graduate of the College and for the past five years in charge of the wood pulping division of the Research Laboratory of the Oxford Paper Company at Rumford, Maine. Mr. Morgan will supervise the installation and operation of equipment in the new semi-commercial laboratory of the College, now under construction.

Dr. Baker Appointed College President

[FROM OUR REGULAR CORRESPONDENT]

SYRACUSE, N. Y., October 22, 1932—Announcement is made of the appointment of Hugh Potter Baker, dean of the forestry department at Syracuse University, and formerly executive secretary of the American Paper and Pulp Association, to the presidency of Massachusetts State College. He is expected to assume his new duties early next year. For many years he has been among the leading advocates of reforestation activities throughout the state and has been largely instrumental for the development of the forestry branch in this city.

Dr. Baker is a man of great personal charm, a student and a sterling friend to all who are fortunate in possessing his acquaintance. He was born at St. Croix Falls, Wis., January 20, 1878, and after attending and teaching country schools secured the degree of B. Sc. in the Michigan State College in 1901. In 1904, he received the degree of Master of Forestry from Yale University and in 1910 the degree of Doctor of Economics in the University of Munich, Bavaria.

Dr. Baker was employed by the United States Forest Service for a period of ten years, and later was Professor of Forestry in the Iowa State College in 1904-1907, and in the Pennsylvania State College in 1907-1912. He was dean and professor of Silviculture in the New York State College of Forestry, Syracuse, in 1912-1920.

The American Paper and Pulp Association secured his services as executive secretary in 1920. He was appointed manager of the trade department of the United States Chamber of Commerce in 1928 and held that post until assuming his duties as dean of the forestry department at Syracuse University in 1930.

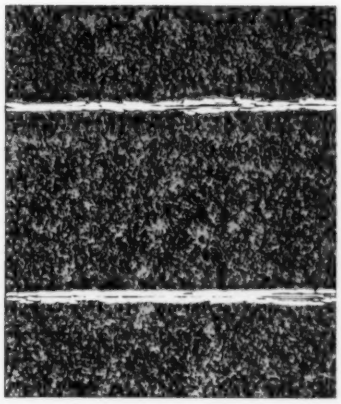
Dr. Baker is a Major in the Officers Reserve Corps and served in the Regular Infantry and on the General Staff of the Army in 1917-1918. He is a member of the Royal Geographical Society of London, the American Geographical Society, New York Academy of Sciences, and Society of American Foresters. Dr. Baker is also a member of the Yale Club of New York, University Club of Syracuse, Cosmos Club of Washington, D. C., and the Union League of Chicago.

DO *YOUR* SCREEN PLATES

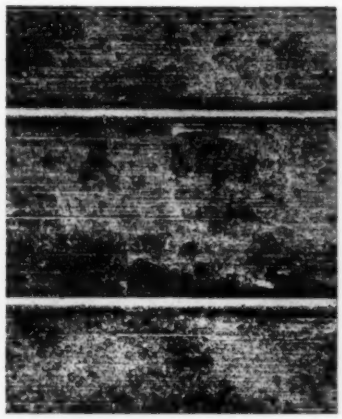
——LOSE SLOT ACCURACY?

——GET DIRTY?

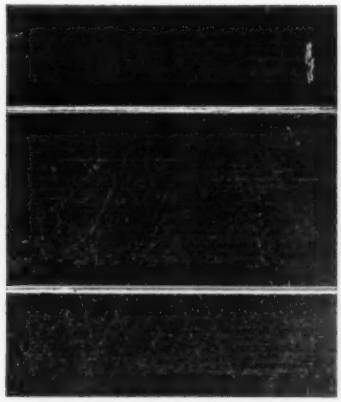
——WEAR QUICKLY?



Ordinary bronze screen plate after 10 months' service (magnified 5 diameters). This plate was recut twice. Note ragged edges, widening of slots and roughness of surface



Ordinary bronze screen plate after 3 months' service (magnified 5 diameters). Note rounding of slot edges (indicated by darker areas), and widening of slot.



Crodon-plated bronze screen plate after 24 months' service (magnified 5 diameters). Note complete preservation of slot accuracy, absence of wear of slot edges and smoothness of surface.

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Paper Manufacturing in the South Assuming Greater Importance

By Warren T. White[1]

RAPID depletion of timber resources in the North, with the attendant increase in the cost of pulpwood, is causing executives of pulp and paper mills to look to the South for future supplies of pulpwood. Each year witnesses marked increase in the amount of paper made in the South. Although the bulk of the output is in kraft, made from southern pine, various grades of paper are included in present manufactures; such as, book, bond and writing papers. Experimental work now in progress gives strong indications that in the very near future an excellent grade of news print will be manufactured from slash pine, one of the most prolific and rapid growing species indigenous to the South.

The Blue Book of Southern Progress, 1931, gives the total present wooded area in the South as 223,813,000 acres, and the total net pine area as 114,684,000 acres. The territory comprising the South Atlantic and Gulf Coastal Plains is heavily timbered with hardwoods and second-growth pine of pulpwood size. Favorable climatic conditions, combined with the long growing season, make for rapidity of growth, and in this area pine trees attain pulpwood size in fifteen to twenty years.

Kraft Production Expands

As already indicated, the greater part of the South's production is still in kraft. In addition to wrapping paper and paper bags, a large amount of kraft pulp is utilized in the manufacture of fiber board. The United States Forest Service says that as a source of this grade of pulp the southern pine cannot be excelled. The production of southern kraft increased from 120,000 tons in 1925 to 325,000 tons in 1929, while the total production of kraft for the entire country increased from 567,000 tons in 1925 to 880,000 tons in 1929. During the same period there was an actual decrease in the production of sulphite and other wrapping paper, the figures showing 724,000 tons in 1925 and 715,000 tons in 1929.

The Blue Book of Southern Progress is authority for the statement that in 1930, out of the country's total production of 883,000 tons of unbleached sulphate pulp, the South furnished approximately 600,000 tons. In other words, the production of sulphite and other papers has not kept pace with the production of kraft. This indicates that southern kraft has cut into the markets which for many years have belonged to sulphite and other pulps, an occurrence which is very logical in view of the cheapness of southern pulpwoods as compared to the rising cost of pulpwood in the North.

Much has been said about "over-production" of kraft and other kinds of paper in the United States; whereas the consumption of all kinds of paper in this country actually exceeds the total production. The United States consumes a considerable volume of pulp and paper imported from abroad. The South uses approximately twice as much paper as it produces. From this it would appear that there is further opportunity for the development of kraft and other papers.

The spread between the total production and consumption is imported from foreign countries where pulp and paper are manufactured at lower costs than in most sections of this country where the price of pulpwood is high. By using low-cost southern pulpwoods, the United States should be able to produce its paper requirements at a profit and also enter into the foreign markets in competition with other countries from which it is now importing a considerable portion of the paper consumed.

Growth of Trees

Southern pines grow faster than any other species of trees in North America. Southern hardwoods also grow much more rapidly than similar species grow in other sections of the country. Austin Cary, of the United States Forest Service, who has been associated with the pulp and paper industry for over thirty years, has stated:

"In the southern pine belt, the United States is thought to possess the greatest single asset in the way of potential source of coniferous wood and lumber that exists anywhere on the face of the earth. Three feet of yearly height growth is not uncommon among the southern pines, that to compare with half as much for white pine in New England, and a foot and less for spruce as it grows in most northern territory. Two cords per acre of wood yearly is not infrequently grown. Sixty cords of rough wood at twenty-five years of age have been personally recorded. At twenty and twenty-five years of age such lands produce trees of sizes nicely suited to use as pulpwood."

In the following tables, the growth of slash pine is compared with that of red spruce:

[1] General Industrial Agent, Seaboard Air Line Railway, Norfolk, Va.

YOUNG SLASH PINE SOUTH CAROLINA COASTAL PLAIN

SEASONAL GROWTH LONG LEAF AND SLASH PINE IN SOUTH CAROLINA

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AVERAGE GROWTH OF SLASH PINE	
Age Years	Yield Per Acre Cords
7	11.5
10	17.5
12	22.5
15	30.0
18	36.0
20	40.0

AVERAGE GROWTH OF RED SPRUCE	
Age Years	Yield Per Acre Cords
20	(only 1.5 in. in diameter; 8 ft. tall)
30	6.7
40	13.8
50	24.5

An average stand of twenty-year-old pine will yield forty cords per acre, while twenty-year-old spruce is not large enough to cut, and even thirty-year-old spruce yields less than seven cords per acre.

Forty per cent of the annual timber growth in the United States is in the South.

Southern Pulpwod Cheaper

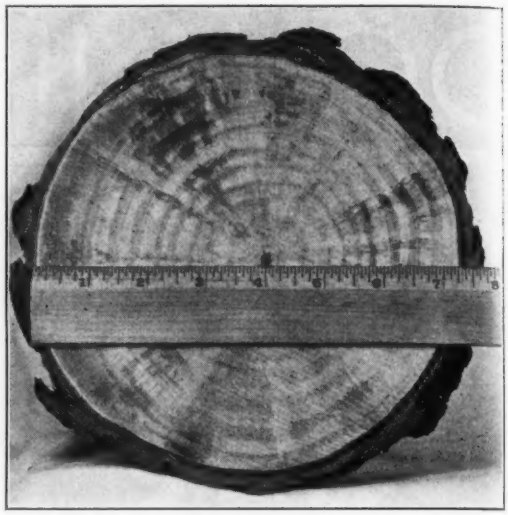
Due to the rapid growth of timber in the South, mild climate which permits operations in the open throughout the winter and other favorable operating factors, pulpwood is much cheaper in the South than in other sections. Pulpwood statistics issued by the American Paper and Pulp Association for the first quarter of 1932 show that, whereas pulpwood in the South can be purchased for as low as $3.47 per cord delivered at the mill, prices for pulpwood for New York and the New England states range as high as $15.00 per cord delivered at the mill.

While the South enjoys favorable operating costs, as reflected in labor, overhead, open season, etc., the greatest saving to be effected in paper manufacturing lies in the cost of pulpwood. The two main factors which determine the competitive chances of a paper mill, aside from manufacturing efficiency, are the cost of pulpwood and the cost of transporting the finished product to central consuming markets.

A regional comparison of pulpwood costs and transportation costs shows that the South Atlantic territory enjoys a very substantial differential over locations in New York state and the New England states. Translated into terms of actual savings to be effected by a paper mill located in the South Atlantic states, this means that a 100-ton mill in the South would effect an annual saving running into the hundreds of thousands of dollars over locations in the territory above referred to.

Southern pulpwoods have a further advantage in that they yield a greater amount of pulp per cord of wood than northern woods. In producing a ton of northern woodpulp, over two cords of wood are required, while considerably less than two cords of wood are consumed in making a ton of southern woodpulp.

Second-growth timber lands can be purchased very cheaply in the South. Through the acquisition of large boundaries and proper forest management, a paper company can insure itself as to a perpetual supply of low-cost pulpwood. Dr. Charles H. Herty, industrial consultant, who is in charge of the experimental paper plant being operated at Savannah by the Georgia Department of Forestry and Geology is authority for the statement that a 100-ton pulp mill located in the center of a circular tract planted in slash pine on a 20-year rotation basis would have an average haul of logs to the mill on a perpetuity basis of three miles, greatly decreasing the cost of transportation and raw material.



TEN YEAR OLD SLASH PINE GEORGIA COASTAL PLAIN

In addition to cheap pulpwood and favorable transportation, there are other factors which make the South attractive for paper manufacturing. Numerous streams assure a plentiful supply of fresh, soft water necessary in pulp and paper operation. The mild climate and open season permit of year-round operation, thereby lowering overhead and obviating the necessity of storing large quantities of pulpwood. An abundance of cheap hydro-electric power and low-cost fuel contribute to economical manufacturing. The various chemicals and other materials necessary in the manufacture of pulp and paper are readily obtainable in the South, and in many instances at a much lower cost than in other sections.

Recent developments in the construction of new mills and expansion of existing facilities indicate that the growth of the paper industry in the South will assume greater proportions in the near future than it has in the past.

A TWENTY-FIVE YEAR OLD STAND OF SHORT LEAF AND SLASH PINE

TYPICAL STAND OF SECOND GROWTH PINE NEAR SAVANNAH, GA.

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Erecting a High-Pressure, High-Temperature Steam Line at West Va. Pulp & Paper Co.*

By H. C. Schramm[1]

PREVIOUSLY to July, 1930, the steam requirements of the Piedmont plant of the West Virginia Pulp and Paper Company were entirely supplied with steam at 180-lb. gage pressure. Since March, 1931, a part of the 180-lb. steam has been replaced with steam at a pressure of 600 lb. and a total temperature of 720 F. A pipe line 920 ft. long was required to convey this steam from a boiler to a turbine exhausting at 20 lb. and inducing or extracting at 180 lb. Desuperheated steam through a temporary line was used while the new line was being erected.

The pipe used in this line is 14-in. O. D. seamless hot-drawn tubing 21/32 in. thick. The Van Stone laps are the full thickness of the tubing and have a phonographic finish. The flanges are 23¾ in. O. D., regular 600-lb. standard forged steel, Van Stone, with high hub and square corners.

Arc Welding With Shielded Electrodes

After the writer had spent some two weeks "pushing" bare and coated electrodes in a welding school in order to become familiar with them, and had searched for references to their use for field welding a 600-lb., 720-F line, it was decided to arc weld the line using shielded electrodes. These could be expected to deposit metal equal to rolled steel, it was learned.

The general instructions given our men for this particular job were: The success of any weld depends largely upon the foundation. In pipe welding only a single V can be used. The edges should have left a shoulder about 1/16 in. high at the bottom of the scarfed edge, if the metal is more than ⅜ in. thick. There must be sufficient space between the parts that are to be welded together to enable the welder to obtain penetration and fusion at the bottom of the V. For metal more than ¼ in. thick this spacing is usually ⅛ to 3/16 in. Use the 3/16 in. spacing.

Place weld in three or four layers. Use 3/16-in. diameter rod for burning in first bead and larger rod, ¼ to ⅜ in. diameter, for the other layers. Weld first bead in bottom by alternate method, i. e., burn in four beads each 2 in. long on 90 deg. centers. Then fill in between these. The other layers may be continuous welds. Clean between each layer with sand blast. If any spots look doubtful, chip them out before proceeding with the weld. Watch penetration closely and adjust current when needed. Keep work clean at all times; the importance of clean work cannot be stressed too strongly. A vertical position weld will be impossible with this electrode if work is not kept clean. Write your initials with the electrode alongside of each weld you make so the responsibility for each weld can be definitely fixed and one man will not be held to account for any failure in the other fellow's work.

Figs. 2 and 3 illustrate the general appearance of metal deposited by each operator. These specimens show the class of work done shortly after starting the job; quality of work improved as the job progressed. Fig. 3 shows the initial of the operator making the weld, and also part of a supporting roller.

Removing Mill Scale from Pipe

A special tool developed by the leader of the crew that erected the 14-in. pipe was used for knocking mill scale loose while the pipe was on the ground. Water-driven tur-

* Heating, Piping and Air Conditioning.
[1] Engineer at Piedmont, W. Va., plant of the West Virginia Pulp and Paper Co.

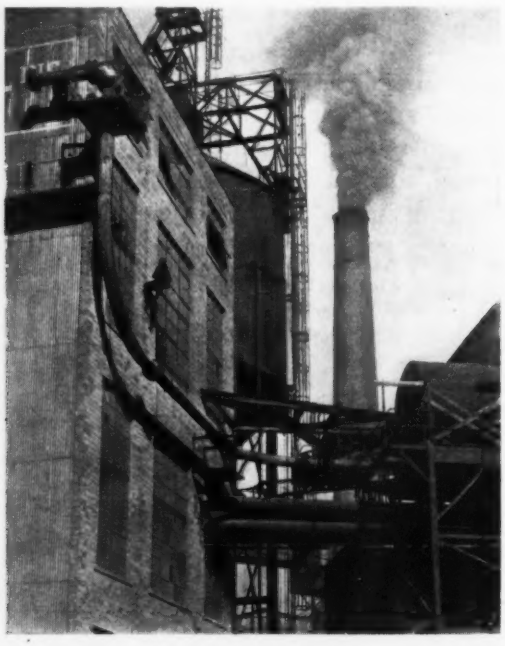
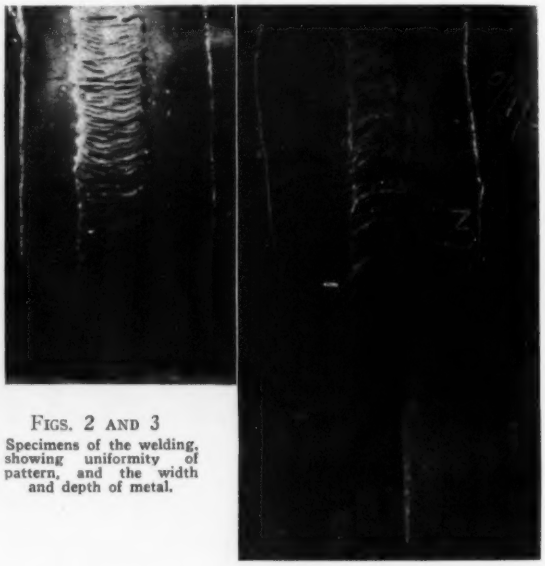
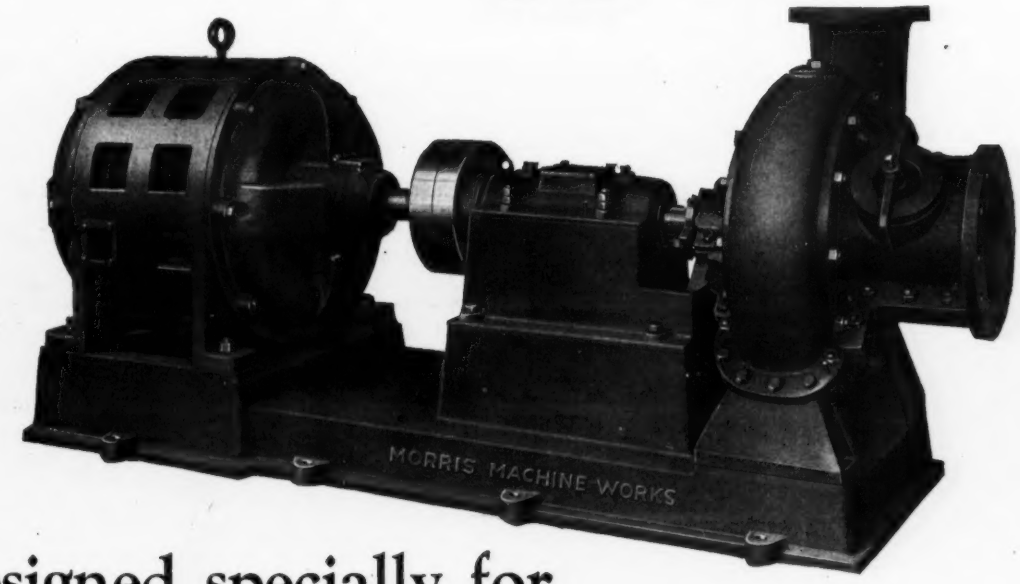


FIG. 1
Note the construction platform on the pipe in this view. How the flanged joints were assembled is described fully in this article.



FIGS. 2 AND 3
Specimens of the welding, showing uniformity of pattern, and the width and depth of metal.

Non-clogging



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This pump is one of the many Morris types for pulp and paper mill service based on 68 years of experience in designing pumps for handling pulp and other solid materials. Whether you require a pump for handling heavy or light stock, chemicals, white water or clear water, for either process work or general plant services, be sure to ask for a Morris quotation and for literature explaining the many advantages of Morris design.

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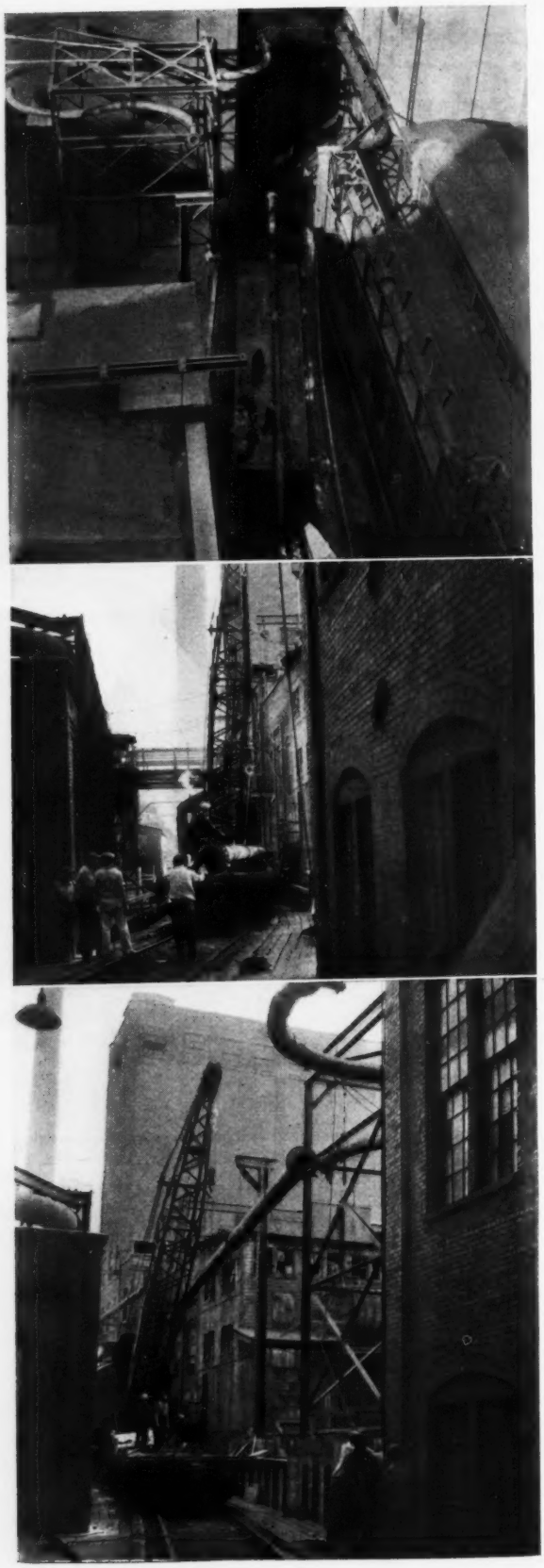
MORRIS
CENTRIFUGAL PUMPS



bines such as are used for boring tubes in boilers were utilized for this. On the shaft of such a unit a steel disk replaced the cutter head. There were three holes in the disk. About a foot of ¾-in. link steel chain was bolted to the disk at each of these holes. The turbine was then run through each pipe and bend. Mill scale has not given any trouble.

Chill Bands Aided Welding

On less particular jobs we have found free spatters of weld metal, short pieces of welding rods and "icicles" of weld metal inside of pipes. Even thorough blowing with 180-lb. steam does not always remove all of this foreign material. A thin chill band of steel placed in a pipe will seal off the joint and prevent such troubles.

The chill bands were turned out of a piece of pipe. They were 2 in. wide and ⅛ in. thick; the outside diameter was 12⅝ in. A 1/16 in. wide by ¼ in. high fin was left on the outside of the band, located 1 in. from either edge. A chill band was used in each joint, the up-stream edge being welded to the inside of the pipe. The next length of pipe was fitted over the projecting edge of the chill band and the whole clamped together for welding.

The thin projection or fin served as an electrical contact point for striking the arc and prevented burning through the band itself, materially assisting in securing the desired penetration and fusion at the base of the V. Due to the fluidity of the shielded rod, the chill bands proved even more valuable than we anticipated.

Clamp Kept Pipe Aligned

Another detail solved on this job was how to keep two lengths of pipe in alignment and properly spaced while making a rolling weld, and for this the special clamp shown in Fig. 7 was designed and built. The 3/16-in. thick spacers were located on 90 deg. centers. The clamp had to have sufficient strength and rigidity to keep the pipes in alignment and at the same time not interfere with the operator. There is now on the market a clamp that is very much better than the one we made.

Rollers or dollys were used to support the straight pipes while making rolled welds on the ground; the design is shown in Fig. 8. Unfortunately pictures are not available showing these rollers in position supporting a section of 14-in. pipe, but the photo indicates the method of supporting and rolling the pipes. The sections were aligned by stretching a string along each side of the pipe; when the pipe was touching or equally distant from both strings, the section on the rollers was considered in alignment. The same type of roller mounted on two channels was used to support those straight sections that had to be welded in the air and that could be rolled.

Assembling the Flanged Joints

Steel "gasket" rings were used in assembling the flanged joints. A ¼ in. thick steel ring with a 1/16 in. wide projection on each side of the inside diameter placed between the Van Stone pipe ends formed an excellent base for welding. The projection centered the ring in the pipe. The flanged joints were assembled with the edge of the ring ¼ in. below the flange rim, and the ¼ in. space was filled with the first bead. Then the metal was built up ¼ in. above the edge of the flange by laying on two more beads.

The bolts were all pulled up just as tight as if a gasket

FIGS. 4, 5 AND 6

(Top). Longest piece of pipe erected in one piece on flat car. (Middle). Same pipe leaving car; note deflection. (Bottom). Almost landed. Opportunity for using the 25-ton locomotive crane in erection influenced location of the line and reduced the cost.

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Hamilton Felts

Hamilton Felts are marked by two blue lines full width of the felt and by one shorter blue line midway between them.

were being depended upon to hold the pressure. Every other bolt was then removed and as much of the welding done as free space permitted. These bolts were replaced and the other half of the bolts removed so the welding could be completed.

100-Ft. Length Raised at One Time

Along the boiler house a 64-ft. length of pipe, welded together, was raised at one time. This looked like a rather long piece of pipe to raise all at once and there was some question about whether it should be reinforced with I-beams or channels while being hoisted. It was finally decided that had the pipe been manufactured in one length there would have been no question about raising it. The butt-welded joint was supposed to be stronger than the pipe, and if it would not support its own weight another type of joint might have to be considered.

The longest piece erected is shown in Fig. 4 on a flat car. In Fig. 5 it is shown leaving the car and by Fig. 6 it is almost in position. This section measured 100 ft. from ange to scarfed end and was assembled, i. e., a number of short lengths welded together, parallel to the siding, loaded on the flat car and moved into position by the 25-ton crane.

A section of pipe 177 ft. long between flanges was erected in three parts and two welds made by rolling the whole after erection. A 222-ft. section of pipe located between towers was supported and rolled on five hanging rollers while making two rolled welds. These were spot-welded and then turned as when welding pieces together on the ground.

Testing the Line

After the line had been erected and welded from the boiler house to the first expansion bend it was pumped full of cold water and the pressure was built up with a hand-operated single-plunger pump until a gage indicated 1500 lb. per sq. in. hydrostatic pressure. This pressure was maintained on the pipe while an inspection of each welded joint was made. Each joint was thoroughly hammered with a 2-lb. ball pein hammer and the pipe was found to be absolutely tight. The other section of the line

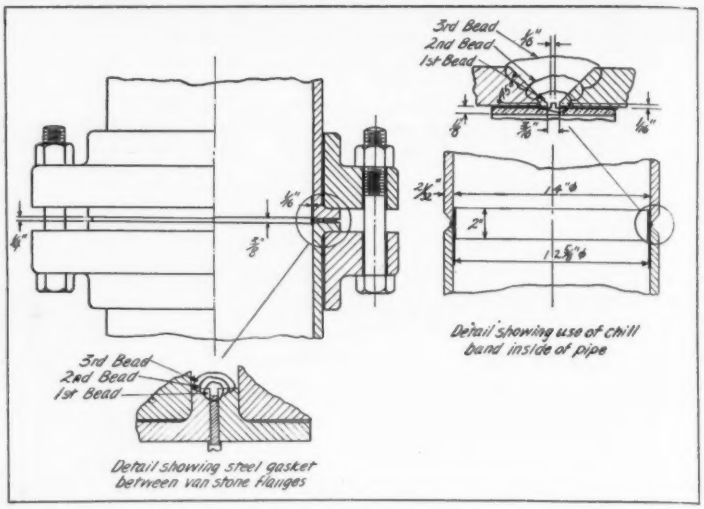


FIG. 9

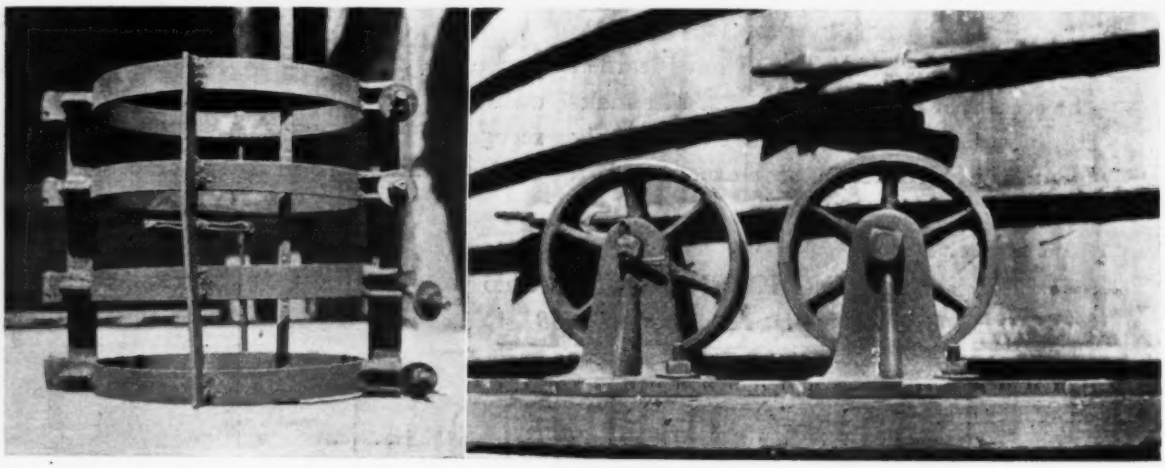
Details showing use of chill band inside pipe which helped in welding, and the steel gasket welded in between the flanges.

was subjected to the same hydrostatic test with the same result.

Parallel to and just above the 14 in. line a 2½-in. water line was installed to bring water from the boiler feed pumps to a superheater in the power house. The operating temperature of the water is 215 F at 600 lb. gage pressure. The pipe is 2½ in. extra heavy and was ordered in random mill lengths. It was welded with the same shielded rod, tested and found tight.

Putting the Line in Service

The turbine was started March 11, 1931, using 180-lb. steam to turn it over. On the 16th it was ready for high-pressure steam. The entire line was then pumped full of water for a 1500-lb. hydrostatic test, and this pressure left for twelve hours. No leaks being found the line was drained and then very thoroughly blown out with 180-lb. steam. The pipe was next brought up to 180-lb. pressure at 420 F temperature and this pressure maintained over night. The following morning the pressure was blown down and the pipe connected to the high-pressure boiler.



FIGS. 7 AND 8

(Left). Pipe clamp devised to keep pipe in alignment during welding. Better ones are now on the market, says the author. (Right). Roller used to support pipe so it could be turned while welding.

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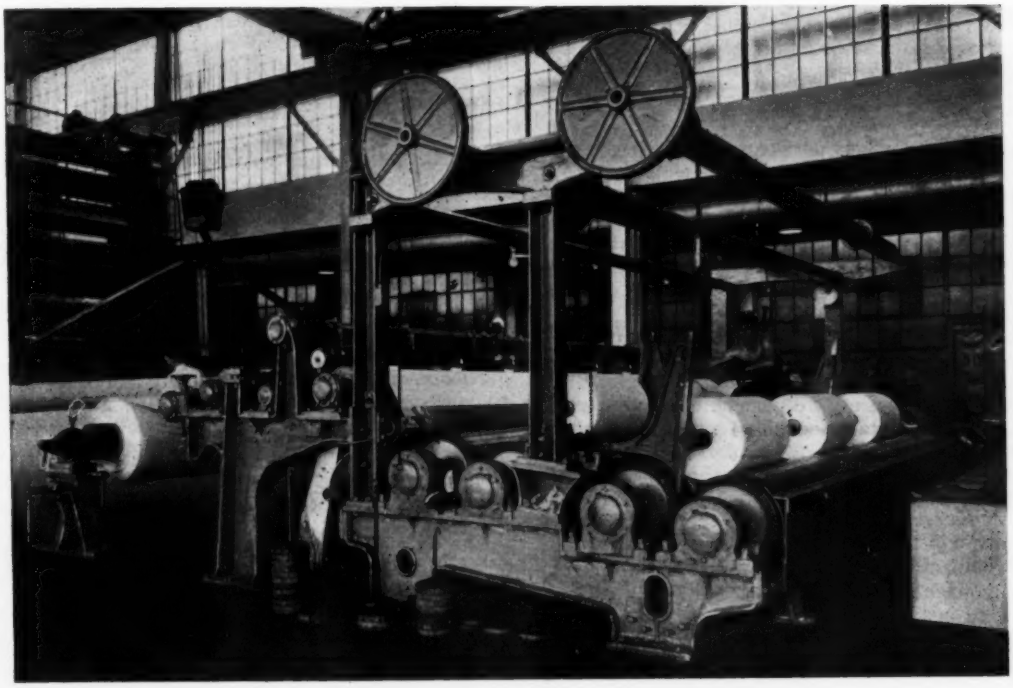
HIGH SPEED FOUR-DRUM WINDER & SLITTER



MOORE & WHITE HIGH SPEED all ball bearing equipped four-drum winder & slitter with quick removable ***bottom*** slitter blades in mill of Champion Fibre Co., Canton, N. C.—236″ width of drums operating at a paper speed of 2100 feet per minute.

DESCRIPTIVE CATALOGUE
UPON REQUEST

The boiler was brought up to pressure and the turbine started on 550-lb., 720-F steam.

When the high-pressure boiler is out of service the 14 in. line is kept warm with 180-lb., 420-F steam. This has happened about 75 times since March, 1931; pressure has been entirely off the 14 in. line three times.

There were fifty-eight welded joints altogether; twenty flanged joints, two sleeves on two expansion bends, two position welds on pipes, and two heads inside of fittings at dead ends totaled twenty-eight position welds. The remaining thirty were rolled welds, five of which were done with the pipe on hanging rollers. During construction of the line there was ordered 300, 475, 200 and 650 lb. of ⅛, ¼, 3/16 and 5/32 in. diameter shielded rods. These were partly used for practice welding in the shop, for practice welding on several other jobs, for actual work on the 14-in. line, for work on a 2½-in. water line and some left for stock. There is no record available of the actual pounds of each size used on the 14-in. steam line.

Work on this pipe line was started in September and finished in November. The two welders and erecting crew did not work on it all the time as there were other construction and repair welds that had to be done by these men. The dates, therefore, do not measure the actual construction time. Itemized costs of erecting the line were not kept separate from the other jobs; hence they cannot be given.

Enough time was spent on each joint to make what we considered a first-class weld. There has been absolutely no trouble with the pipe line.

Mill Improvements Made by International Paper Co. During Past Year

BETWEEN July, 1931, and July, 1932, International Paper Company did very little construction work but made a great many general improvements throughout its plants in order to reduce maintenance and operating costs, and in some cases to speed up production. A list of these general improvements is as follows:

Paper Machines

On a number of machines the company added additional screening capacity ahead of the paper machines. It also installed improved slices. The Fourdrinier section of a couple of machines were rebuilt and a number of suction couches and presses were installed. The company put in anti-friction bearings on a number of these rolls. In one case the company installed equipment to drive the top press roll. Some of its paper machines had general changes made to them in order to make specialties. In other installations it motorized parts of the machines which were driven by steam power.

A number of improvements were made in drives for machines, particularly in installation of magnetic clutches and enclosed beveled gears. Obsolete winders were replaced with modern equipment, and on one machine a new English reel was installed. In a number of cases paper machine speed was increased by changes to the drives. Briner economizers were installed on three paper machines and in one mill the company added the rate of rise fire protection equipment in connection with paper machine economizers. Regulators were installed on quite a number of machines to control the moisture in the paper.

Ground Wood Mills

At two mills the magazines were widened in chain feed grinders in order to increase production.

Sulphite Mills

The company installed two Jenssen acid-making systems to replace old wooden towers, and is making an installation of a hot acid system as well at one of those mills. During the past year the company continued to use chrome nickel steel alloy pipe and fittings in sulphite mill replacements. A number of the old type relief gas coolers were replaced with those made from the same alloy and these have been equipped with thermostatic control valves. At one of the company's plants felt lined riffler has been installed to clean up pulp.

Beater Rooms

In a number of plants additional beaters were installed and in others old ones were replaced. A sulphite breaker beater was installed at one of the mills. The company did considerable work to increase the consistency of the stock to the beaters and in some cases installed pumps especially designed for this work. The company made quite a number of replacements of inefficient pumps. A trial installation of anti-friction bearings on a Jordan was made.

Finishing Rooms

Anti-friction bearings on two super-calender stocks were installed and on one of these the drive was replaced with a direct current variable speed motor.

Wood Preparation

At one of its plants the company installed a bark press, conveyors, and Dutch ovens to dispose of bark. At another knot-boring machines were installed. A chipper was equipped with anti-friction bearings and several chip screens were installed.

Wood Handling and Storage

The company equipped two of its mills with pulp wood drags. These units are motor driven.

Power Plants

At one of its mills the company installed fuel oil system to replace or complement the existing pulverized fuel installation.

Miscellaneous

Equipment was installed in a number of plants to chlorinate the fresh water supply as a slime preventive. A number of installations were added to handle clay pneumatically. A number of improved size-making equipments and alum dissolving systems were installed. In one plant the company installed modern core-making machinery and in others automatic core-capping machines.

Paper Products

In its bag-making plants, the company installed new bag machines, W. & H. Analine web printer, and tuber cut-off for long and short tubes.

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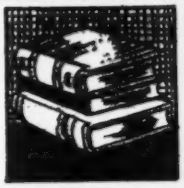

CHEMISTRY *of the* SULPHITE PROCESS

by R. N. Miller and W. H. Swanson
M. W. Bray, R. Soderquist, T. M. Andrews,
W. H. Mansson

The papers which constitute this book appeared originally in the trade and technological journals as current reports of the progress of investigations under way at the United States Forest Products Laboratory for a period of about six years beginning with 1921. This information is the accumulation of years of experience. The method by which sulphite with the desired properties is to be made, the conditions under which it must be cooked, the strength of acid to be used, the equipment, operation and materials are all fully covered in this book. Included in this volume also is "Sulphite Pulp from Spruce" by Donald E. Cable.

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Georgia's Experimental Pulp and Paper Plant Now Operating Successfully

IN THE spring of this year Georgia's experimental pulp and paper plant at Savannah, Ga., began operations, under the direction of Dr. Charles H. Herty, research chemist in charge of the Division of Pulp and Paper Research, recently created branch of the Department of Forestry and Geological Development authorized by the Georgia State Legislature.

Courtesy: Chemical & Metallurgical Engineering

TESTING LABORATORY WITH CONSTANT TEMPERATURE AND HUMIDITY, AND DARK ROOMS

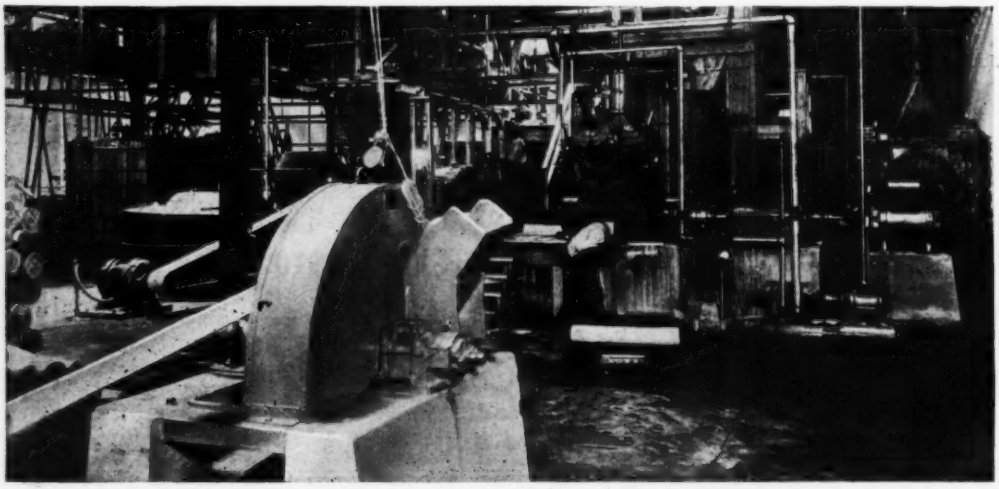
History was made in the pulp and paper industry of the South recently when the successful first run of white paper was witnessed in the research plant. Dr. Herty had long believed in and advocated the development of a pulp and paper manufacturing industry in the South, utilizing as raw material the several species of southern pine that grow so prolifically in the Atlantic Gulf States from Georgia to Texas, and used in part only for lumber and naval stores.

The remarkable development of the kraft paper industry in the South demonstrated the soundness of such logic and the possibilities in further development toward the manufacture of news print and white papers. The fact that such papers had already been made successfully in an experimental way resulted in an organized movement to prove out the commercial possibilities.

Dr. Herty selected a versatile staff of technical experts to operate the plant and to assist him in his research work. George C. McNaughton, who for seven years was with the Forest Products Laboratory, Madison, Wis., and later with the George H. Mead Paper Company at Kingsport, Tenn., and Chillicothe, Ohio, is the assistant director. Bruce Suttle, formerly with the Champion Fibre Company, Canton, N. C., is the plant engineer.

The chemist in charge of the laboratory pulp and paper tests is W. F. Allen, who has been with the Bureau of Standards, Washington, D. C.; the National Research Council; and has also done research work with the Binders Board Manufacturers Association. J. B. Osborne, Jr., who is also connected with the laboratory, has done considerable work in oil and sugar chemistry in this country and the tropics and was formerly connected with the Pan-American Petroleum Corporation.

The layout of the plant was of utmost importance not only to provide the latest and best type of equipment, but to parallel as closely as possible the technical and mechanical processes of commercial plants and, at the same time, keep the cost within the funds available. This was only made possible by the splendid cooperation of contributing manufacturers, the majority of whom supplied the equipment at cost or less.



Courtesy: Chemical & Metallurgical Engineering

FRONT OF LABORATORY; CHIPPER IN FOREGROUND, FOLLOWED BY GRINDER, MOTOR AND PUMPS

After considering offers from eight cities in the State, Savannah was finally selected and a warehouse building with adjoining dock and railroad siding, on the site of the

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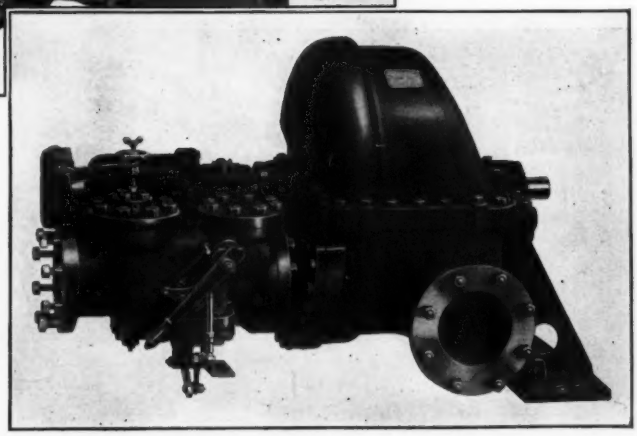


175-53

GENERAL ELECTRIC

Savannah Electric and Power Company, was made available by the Industrial Committee of Savannah through the co-operation of the Power Company, who are also supplying power and light, and otherwise rendering assistance.

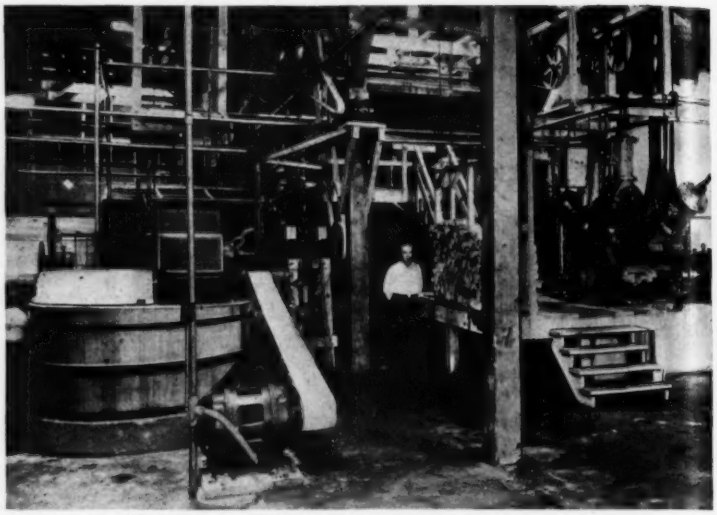
The Central of Georgia Railway co-operated by expediting the delivery of equipment, lending the assistance of their staff of construction engineers, and donating supplies for the foundation work.

Machinery Equipment

The machinery equipment of the research plant is as follows:

The semi-commercial section, planned to handle up to about two tons of paper per day of 24 hours, comprises: Circular saw for cutting pulp wood to length, 47 inch wood chipper, oscillating chip screen, sulphite digester of 60 cubic feet capacity made of acid resisting stainless steel, digester circulating pump and acid system, three-pocket wood grinder with 42 inch diameter stone for 18 inch wood, water pressure pump and regulator for grinder, three-speed gear reduction for grinder, sliver screen and chest for either ground wood or sulphite pulp, centrifugal pump for delivering pulp to pulp screen, six-plate pulp screen, pulp thickener or decker, one sulphite and one ground wood storage chest, each 7 feet diameter, 7 feet 6 inch high, complete with agitator equipment; post type plunger pump for delivering pulp to beaters, one 300 lb. beater with bleaching and washing equipment, one 50 lb. beater, post type plunger pump for delivering beaten stock to machine chests, two machine stock chests, each 7 feet diameter, 7 feet 6 inch high, complete with agitator equipment; post type single plunger pump for delivering stock to Jordan, one motor driven Jordan engine with regulating box, six-plate machine screen.

The paper machine is of the Pusey-Jones standard type to produce a sheet 26 inch maximum width, arranged with fourdrinier part having wire 31 inch wide x 33 feet long, press part with two sets of main presses, dry part with 9-24 inch diameter drying cylinders, calender stack containing five rolls, two-drum upright reel, slitter and single shaft winder, driving arrangement with enclosed worm gear drive unit for each section connected by means of belts on cone pulleys to overhead line shaft located parallel with the machine, machine speed 15 to 150 feet per minute through a Reeves change speed device; a combination suction and white water pump with separator tank for the flat fourdrinier boxes and a centrifugal pump for handling the white water from the fourdrinier save-all.

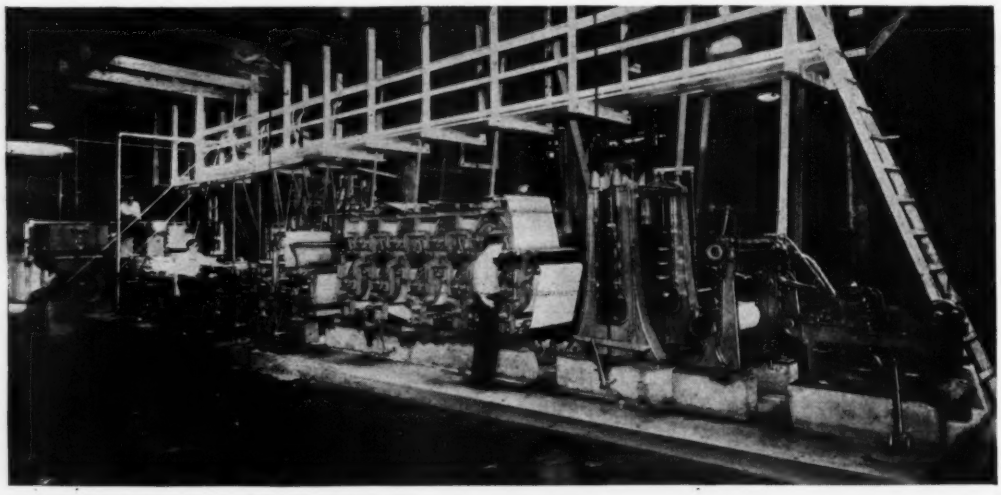


Courtesy: Chemical & Metallurgical Engineering

BEATER IN LEFT FOREGROUND, GRINDER TO THE RIGHT

The Blaw-Knox Company, of Pittsburgh, sent several engineers to Savannah to cooperate. The particular problem that had to be solved was that of fabricating a sulphite digester of 60-feet cubic capacity that would prevent corrosion from setting in around the welded areas. After experimenting, it was determined that the most feasible and successful means of accomplishing this was with the special "Ductilweld" process on a base metal of chrome nickel. As the digester is an important unit in the plant, it was essential that the welds and weld areas be as resistant to corrosion as the base metal.

A number of the machinery units are driven by direct connected motors and the others belted from countershafting, in turn driven by motors. An oil-fired steam boiler of 30 hp. capacity supplies necessary steam for digesting and drying.



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000 for equipment obtained by Dr. Herty from the Chemical Foundation, Inc.; second, by an appropriation from the Georgia State Legislature of $20,000 annually for the years 1932-1933 for maintenance and personnel; and third, by the generous assistance of the Industrial Committee of the City of Savannah and the machinery, equipment and supply manufacturers.

Fundamental Advantages

Power can be developed at very low rates in the South through the combustion of natural gas in the Mississippi Valley, the cheap coals in central Alabama, or cheap fuel oil which can be supplied from the Texas and Oklahoma fields along the Gulf and Atlantic coasts. Paper manufacture requires both power and steam for processing. Turbine engines generating power at high pressures and bled for steam will give the answer to the power problem.

As to labor, the case for the South is even more strengthened. In the North, common labor is paid from $3.50 to $4.00 per day. In the South, first-class negro labor can be readily obtained for $1.50 per day.

As to chemicals: limestone is available throughout the South, as it constitutes one of its major mineral products. Sulphur is a southern industry and a southern mill would therefore profit by decreased cost of transportation of this product. Salt abounds in Louisiana, and the manufacture of chlorine from salt awaits only the development of a consuming market.

The kaolin, or china clay, produced in the United States and used as a filler, comes from Georgia, South Carolina and Florida—the heart of the pine belt. One northern manufacturer told Dr. Herty that, from a calculation the manufacturer made from his own freight bills that he would save in freight alone on clay, $1.00 per ton on his pulp if his mill were located near the southern clay deposits.

Size is made from rosin, a product produced by the long leaf and the slash pines. Near Savannah a new rosin size plant is being constructed which will be able to furnish this product to the paper manufacturer quite free of transportation costs.

As to disposition of the manufactured products: a fine network of railroads, which the South already has in the majority of sections, with quick service leading to the interior, and coastwise steamers reaching all of the important eastern markets within two or three days, would assure ample ability to meet competition as to time and delivery cost.

As to mechanical pulp, which constitutes 75 per cent to 80 per cent of news print, extensive research will be required to determine the best type of fiber for news print resulting from varying conditions, such as the speed of rotation of the stone, the pressure of the wood against the stone, the temperature of grinding, and the proper sizing of the wood.

Contributors to the Project

Following is a list of manufacturers who contributed of their time, experience and good-will in furthering the success of this project, and all of whom received the grateful acknowledgement of the Georgia State Department of Forestry, Dr. Charles H. Herty and the Pusey & Jones Corporation, designers of the plant:

Carthage Machine Company, Carthage, N. Y., wood chipper and wood grinder.

S. K. F. Industries, New York City, grinder roller bearings.

Lombard & Co., Boston, Mass., grinder stone.

Meyer Governor Company, Minneapolis, Minn., grinder regulator.

Frederick Iron and Steel Company, Frederick, Md., grinder pressure pump and acid pump.

Philadelphia Gear Works, Philadelphia, Pa., grinder gear speed change.

Valley Iron Works Company, Appleton, Wis., pulp screen, beaters, jordan, machine screen and laboratory equipment.

Blaw-Knox Company, Pittsburgh, Pa., digester.

Winslow Company, Inc., Portland, Me., blow pit tile.

Improved Paper Machinery Corporation, Nashua, N. H., pulp thickener.

Chemi-Pulp Process Company, Watertown, N. Y., acid circulating system.

Alloy Steel Products Company, Boston, Mass., chrome steel valves and fittings.

The Moore & White Company, Philadelphia, Pa., stuff chest agitators.

Nash Engineering Company, South Norwalk, Conn., machine suction pump.

G. Woolford Wood Tank Company, Philadelphia, Pa., stock chests.

Bartlett-Hayward Company, Baltimore, Md., drive flexible couplings.

United States Rubber Company, Passaic, N. J., machine deckle straps.

Albany Felt Company, Albany, N. Y., couch jacket and press felt.

Cheney Bigelow Wire Works, Springfield, Mass., fourdrinier wire.

Fitchburg Duck Mills, Fitchburg, Mass., drier felts.

American Wringer Company, Woonsocket, R. I., rubber covered press rolls.

Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., motors and electrical equipment.

B. F. Goodrich Company, Atlanta, Ga., belting and hose.

Hooker Electro-Chemical Company, Niagara Falls, N. Y., chlorine and chemicals.

Keystone Lime Works, Inc., Keystone, Ala., lime products.

Gulf Refining Company, Savannah, Ga., fuel oil.

Superintendents Meet at Holyoke

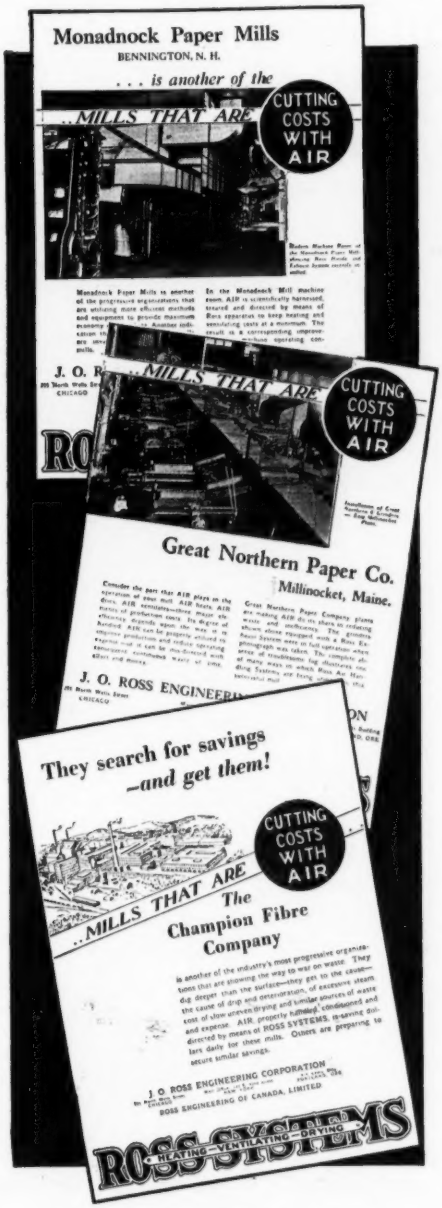
HOLYOKE, Mass., October 25, 1932.—The October meeting of the Connecticut Valley Division, American Pulp and Paper Mill Superintendents Association was held Saturday afternoon and evening at the Hotel Nonotuck with about 100 present. The business meeting was held in the afternoon with dinner and program of entertainment at night closing with general dancing.

Past National President Benjamin T. Larrabee of Long View, Wash., was a guest of honor and Chairman A. B. C. Drew presided. Wives and friends of the members attended the banquet. These officers were elected: Chairman, A. B. C. Drew of New Bedford; first vice chairman, Claude H. Smith of Holyoke; second vice chairman, Stephen D. Stapeley of Holyoke; secretary-treasurer, Forbes Wood of Holyoke. All but Mr. Stapeley were reelections. A letter was read from President William H. Brydges of Big Island, Va., regretting his inability to be present and praising the group highly for their hearty cooperation.

Papers were read by R. B. Martin of the Wallace & Tiernan Company on "Slime in Paper Mills; its Origin and Prevention", by C. H. R. Johnson of the Downingtown Manufacturing Company on "Extractor Rolls for Paper Mills"; and by Frank M. Yenney of the Socony Vacuum Company on "Paper Mills Lubrication."

The committee of arrangements consisted of Claude H. Smith, John J. White, Stephen D. Stapeley and Forbes Wood. The next meeting will be held as usual at the call of the chairman.

—more mills adopting this method!



Three from a series of advertisements appearing in paper trade publications.

"CUTTING COSTS WITH AIR"

At this particular time, it affords a most desirable and effective method for securing much needed reductions in operating expense with accompanying improvement in machine operating conditions. With ROSS apparatus to scientifically treat and direct AIR, serious sources of waste in time, effort and money are being completely eliminated.

We invite inquiries regarding specific applications of Ross-Briner Economizers, Ross-Grewin High Pressure Ventilation, Ross Vapor Absorption System, Ross Grinder Exhaust System, Ross Machine Room Systems, Ross Drying and Conditioning Systems.

J. O. ROSS ENGINEERING CORPORATION

201 North Wells Street, CHICAGO — MAIN OFFICE—122 East 42nd St., NEW YORK — 414 Lewis Building, PORTLAND, ORE.

ROSS ENGINEERING OF CANADA, LIMITED

ROSS SYSTEMS
HEATING—VENTILATING—DRYING

Vertical Stack Driers Without Drier Felts on Fourdrinier Machines in Miami Valley

By Joseph H. Wallace[1]

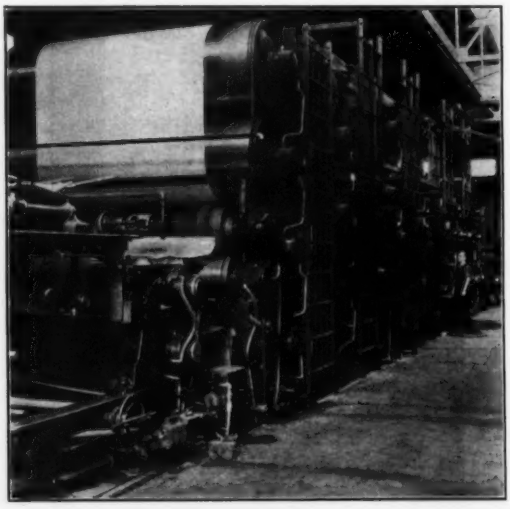
FROM time to time someone who will not be hampered by tradition "upsets the apple cart" by doing something that hasn't been done before, often against the arguments of the experts that "it can't be done." If he fails, the experts say "I told you so," and chortle with glee. If he succeeds, many still continue to claim that it can't be done, until finally the new act finds its own particular place in the arts and becomes common practice. Then along comes another progressive, the old apple cart is again upset and "a new theory" is written to fit the new set of facts.

Wallace Tower, well known paper mill engineer and partner of Hardy S. Ferguson & Co. of New York City, in his historical data relating to the development of the Fourdrinier paper machine, has given due credit to Thomas B. Compton, an English paper maker, for the first installation of steam cylinders for the drying of paper and sets the date at 1823.

The first drying sections consisted of four to six drying cylinders arranged in a single horizontal tier. Later on, as more driers were needed the two tier arrangement became usual practice and as even more driers became needed, three and even four tiers were often used. It was almost a century after steam cylinders for drying paper were used before anyone suggested "standing them up."

Vertical Stack Drying

It is now several years since H. L. Kutter, president of the Black-Clawson Company, invented the vertical stack of driers and over 6000 driers so arranged are now in satisfactory operation on cylinder paper machines making a great variety of heavy and medium weight paper products. The Vertical Stack Drier Section has become standard practice in the manufacture of paper boards of all

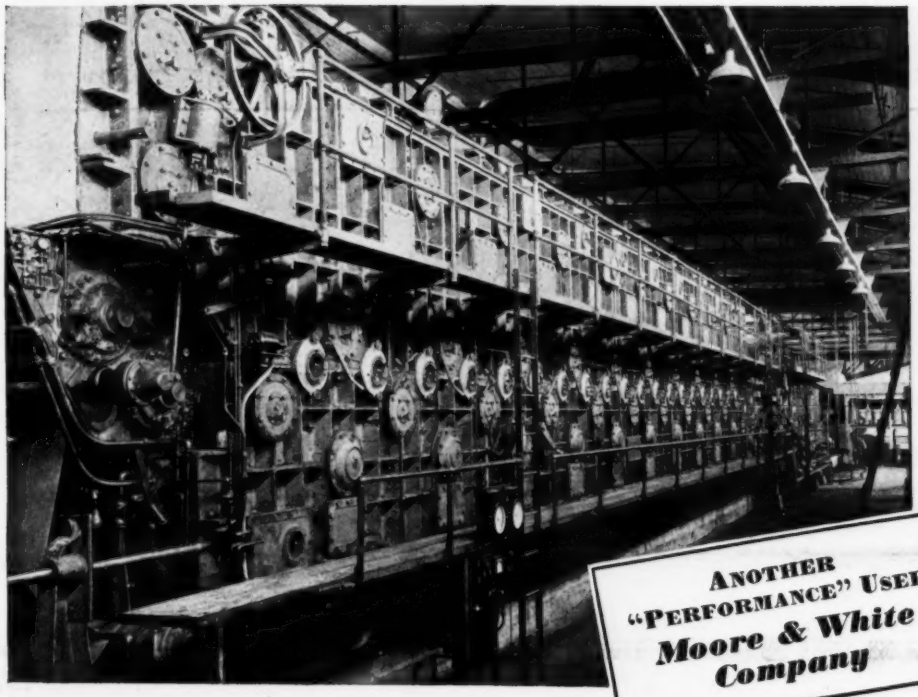


BLACK-CLAWSON FOURDRINIERS, VERTICAL DRIERS, SORG PAPER CO.

TWO BLACK-CLAWSON FOURDRINIERS, VERTICAL DRIERS, BECKETT PAPER CO.

[1] Engineer, Black-Clawson Co., Hamilton, Ohio.

100 PER CENT SKF FOR UNFAILING PERFORMANCE



WHERE PERFORMANCE TAKES PREFERENCE OVER PRICE

COMPLETELY equipped with SKF Bearings for unfailing performance. That's the story in back of the Minton Vacuum Dryer, built by the Moore and White Co., and now operating successfully in the kraft paper mill of the Longview Fibre Company, Longview, Wash. There are 21 dryers, five feet in diameter, with a face of 90 inches each on this machine which operates at speeds up to 1,500 feet per minute.

Nothing could take the place of reliability on this application. Production must be continuous. Bearing failure would be costly. Precision, too, is demanded to maintain the vacuum. SKF Bearings meet every one of these requirements. They are smooth running, eliminate friction's drag, show no wear and need no adjustments. All are vital reasons why SKF Performance Takes Preference Over Price.

You may buy a bearing as a bargain but try and get a bargain out of using it, for nothing is apt to cost so much as a bearing that cost so little.

2894

SKF INDUSTRIES, INC. 40 EAST 34th STREET, NEW YORK, N. Y.

SKF

Ball and Roller Bearings

kinds. In spite of evidence, however, it has been difficult to introduce vertical stack drying on Fourdrinier paper machines.

It is customary to withhold credit to progressive spirits until they have left this world, or at least until the ideas they have begotten shall have become regular practice in the art, but we want to acclaim herewith paper makers of the Miami Valley who do their own thinking, and are not hindered by the knowledge that "our forefathers didn't make paper that way."

Among them is one who brings to mind the poem of Dr. Oliver Wendell Holmes in which he said:

"And there's a bright youngster of excellent pith
Fate tried to conceal him by calling him SMITH."

Frank Smith, of Sorg Paper Company, Middletown, Ohio, is well known throughout the paper industry as one who refuses to adhere to the traditions of his ancestors.

Another Miami Valley paper maker who insists on doing his own thinking is Homer Latimer, of Beckett Paper Company, of Hamilton, Ohio. As a son of Tom Latimer, a well known "Master of Arts" in paper machine development, Homer may be said to have been born and nurtured in paper mill tradition, but like his father he has a habit of making tradition whenever it appears to be desirable in the course of his business.

Some time ago in rearranging one of their Fourdrinier machines at the Beckett Paper Company at Hamilton, Ohio, the Black-Clawson Company installed some vertical stack driers without drier felts. After operating this machine for some time on their famous Buckeye line of cover papers, Homer Latimer wrote the Black-Clawson Company that "the vertical installation had reduced the steam pressure required on the driers and increased the production of the machine," that "vapor pockets are eliminated and a more uniformly dried sheet is now obtained." Later he wrote "the few fears we may have had regarding the running of light weight papers on vertical driers without felts have been dispelled."

Last summer (1931) Frank Smith, of Sorg Paper Company, Middletown, Ohio, ordered the rebuilding of a Black-Clawson Fourdrinier machine that had been making all sorts of papers. It had sixteen 48-inch diameter driers ahead of the size press. They were of the double deck horizontal type. These were replaced by thirty-three 36-inch driers in vertical stack sections four driers high. Since this installation was made, Frank Smith has been making a wide variety of Fourdrinier papers on vertical stack driers without drier felts and incidentally making more history.

But there is still more progress to report from the Miami Valley "where men are paper makers". After their experience with the first installation, the Beckett Paper Company ordered the rebuilding of both of their paper machines and the mill is now 100 per cent Vertical Driers without drier felts! And so here in the Miami Valley three Fourdrinier paper machines are now demonstrating the old adage that you can't stop progress with "it can't be done" and those two irrepressible youngsters, viz:—Frank Smith and Homer Latimer, have upset an "old apple cart". They will not respect the traditions of their ancestors but insist on thinking for themselves.

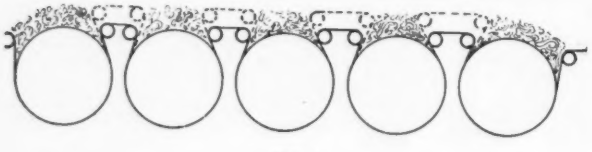


FIG. 1

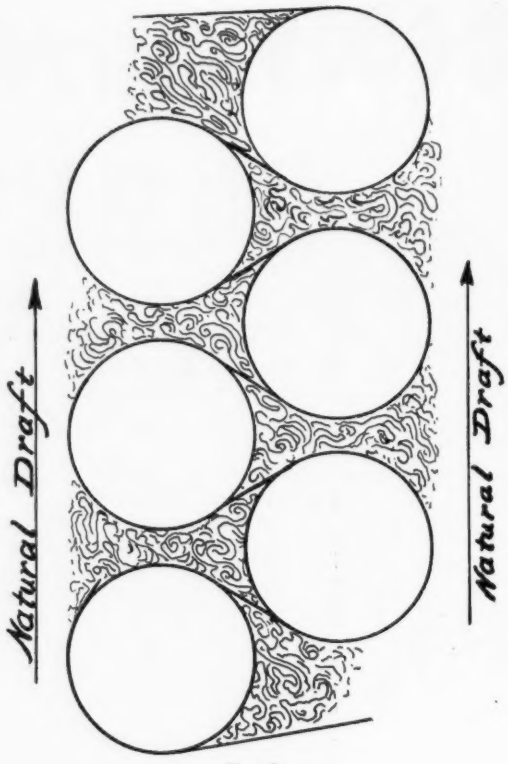


FIG. 3

Various Styles Developed

Various styles in the arrangement of drying cylinders have been developed. Fig. 1 shows a single tier arrangement. Some of this type are still operating on special lines of product where quantity is not an object.

A drying cylinder, a felt roll and a couple of paper rolls, another drying cylinder, another felt roll and a couple more idler rolls, and so on.

With this arrangement and a bottom drier felt only, the paper makers can get good drying as the felt and paper are so arranged that vapor can go off the machine vertically with no pockets to trap the vapor.

But this arrangement has such a limited capacity that it was superseded in most cases by a double tier arrangement, which is basically unchanged on Fourdrinier paper machines in almost a hundred years.

At points (A) Fig. 2, will be seen what we mean when we refer to pockets to trap vapor, and prevent uniform drying action across the sheet.

Fig. 3 shows the vertical stack arrangement with which the Black-Clawson Company have standardized the paper board game during the past ten years. The natural upward draft of hot vapor can be helped by artificial draft and the admission from below of dry air. The vertical box frames that carry the driers are hollow castings pro-

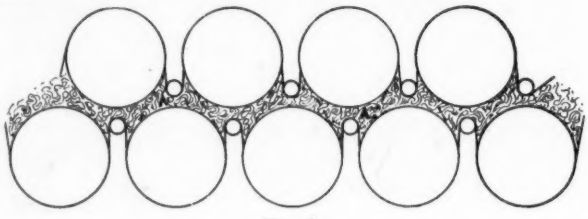
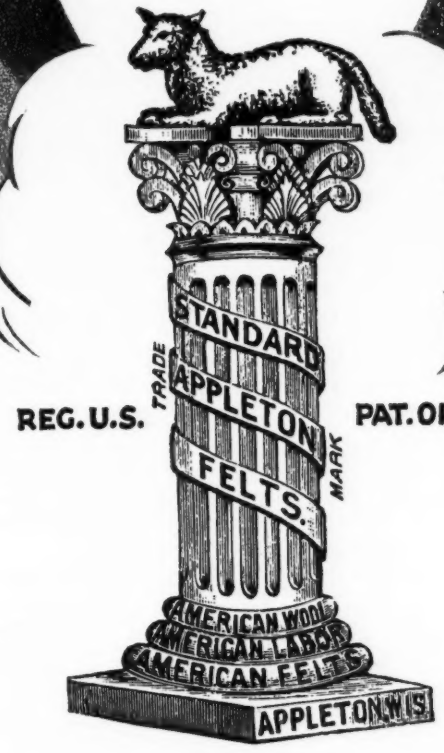


FIG. 2

Appleton
Felts and Jackets

The exacting conditions under which Appleton Felts are made are only half the story of Appleton Felts. They are designed right and as quality products ought to be—controlled in production, every step of their manufacture—to assure quality and service to users — made to meet the definite requirements of your mill.

Let us help you solve your felt problems.



APPLETON WOOLEN MILLS
Appleton, Wisconsin

vided with inlet and outlet connections permitting distribution of air wherever desired.

The Sheahan rope carrier maintains a uniform tension on the sheet while it takes the paper over the vertical drier section. A continuous self-filtering cascade system lubricates the drier bearings. Transfer driers, a new feature, shorten the draws between driers and make vertical stack driers adaptable to light weight papers. After all, the vertical stack is merely a double horizontal tier stood on end, in which the draws are reduced and the drier felts eliminated.

An accompanying picture shows installation of vertical driers made by Frank Smith at the Sorg Paper Company, Middletown, Ohio. Going over the vertical section, a sheet of 14-lb. folio can be seen. This installation is a modification of the vertical stack arrangement that has had the bulk of the cylinder machine business for years. Certain changes have been made to adapt the vertical driers to light weight papers, but it is basically the same arrangement that has been giving uniform drying across the sheet and saving space for ten years.

Two Fourdrinier machines have recently been rebuilt in the Beckett mill in Hamilton, and now the Beckett Paper Company mill is 100 per cent vertical driers and drier felts are out! The Beckett Paper Company has a reputation for quality products of a wide variety, including bonds, writings, texts, papeteries, offsets and specialties which include their famous Buckeye Covers. An accompanying picture shows their two Fourdrinier machines.

The vertical stack arrangement of driers has made possible a lengthening of wires as well as an increase in drying capacity in machine rooms crowded lengthwise by old machines, even when the basement could not be utilized for driers.

Saving in floor space has recently been shown to have great possibilities, especially where space usually wasted under the driers is available.

In a recent layout, an increased wire length, and more than twice the drying capacity are made possible in the same building by utilizing a twenty foot basement as well as the main floor for vertical stacks. Six feet headroom under bottom driers, stacks serving as air ducts driers arranged five high, the top clearing a crane 15 feet 0 inches from the main floor and forty driers in a space forty feet long should be a convincing argument to the manager or owner who is crowded in the machine room and wants to add to his machines. (See Figs. 4 and 5.)

The following figures ought to be interesting to paper makers. A moisture test taken not long ago on a double deck drier installation showed a moisture content on the front side of the machine of 61.42 per cent, in the middle of the sheet it was 67 per cent and on the drive side 65.5 per cent. Tests in other mills have shown similar conditions and the chances are two to one that were paper makers to check up their own conditions they would be surprised.

The elimination of drier felts and the vertical stack drier arrangement saves first cost and operating expense.

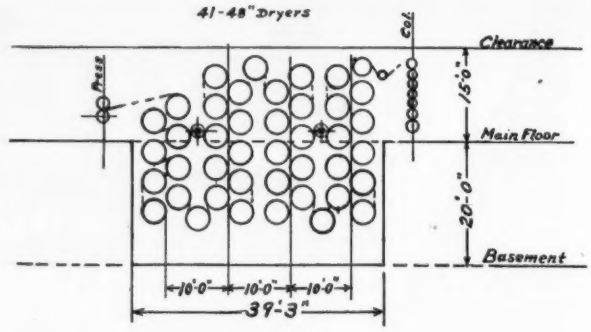


FIG. 5

Felt rolls, guides, and stretchers have to be maintained when installed. Old driers can usually be utilized in connection with additional ones needed, and "piling 'em up" certainly makes that crowded machine room look like it had been stretched without a cent of expense.

And so we salute Frank Smith and Homer Latimer who do their own thinking and upset apple carts whenever the apple cart is blocking progress.

Conclusion

From recent observations of the drying of various medium and light weight Fourdrinier papers on Vertical Stack Sections, we feel that we can say that on comparatively free sheets no difficulty arises, while on slow stock there appears to be no more trouble than is usual with these stocks on any arrangement of driers.

Comparing double, triple and quadruple deck arrangement with vertical stack arrangement we find the verticals to have the following decided advantages:—

(A) Moisture pockets in horizontal arrangements require more pressing in middle of sheet and therefore, more crown in press rolls. This again causes more depreciation on wet felts.

(B) On the multiple tier horizontal arrangements, the tendency for vapor to get between driers and paper causes cockling whereas on vertical driers the vapor passes away easily.

(C) Long leads of paper are required on triple and quadruple tier arrangements, and the sheet is strained and often scraped by this condition.

(D) A maximum of thirteen driers on one drive-in shaft on triple tier installations often requires new pinions, whereas on six high vertical installations with 24 driers on one drive-in no new pinions have ever been needed.

(E) The cumulative back lash on horizontal driers is greater than on vertical driers.

(F) No rope carrier system has ever been successfully used on triple or quadruple tier drying sections.

(G) Multiple tier horizontal arrangements generally show noticeable vibration whereas none can be felt on the vertical stack.

(Continued on page 72)

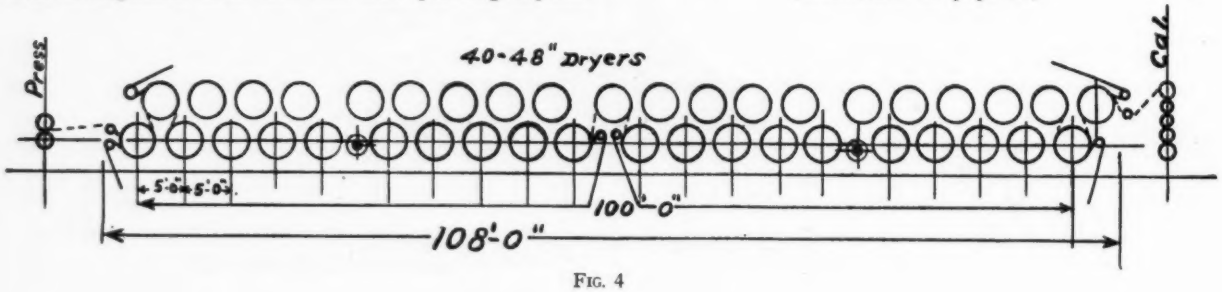


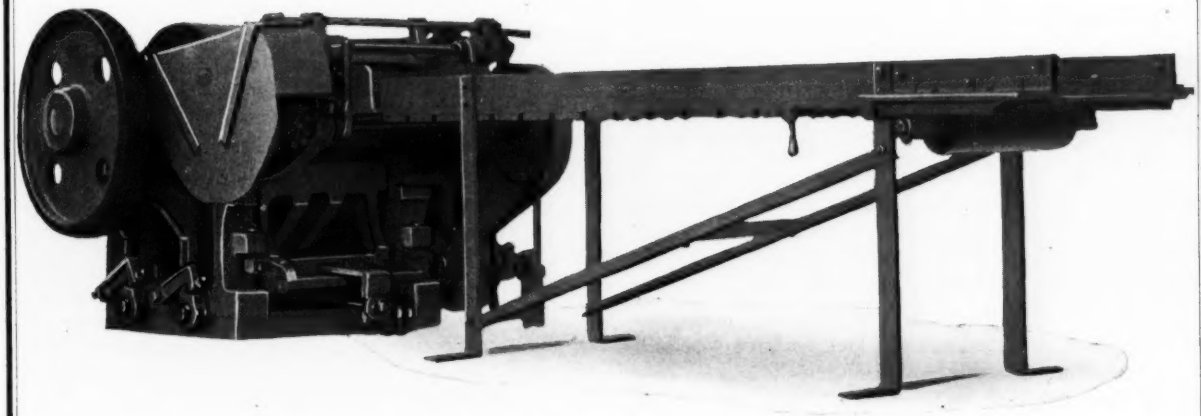
FIG. 4

THE CORNER HAS BEEN TURNED

SOON YOU WILL BE BUSY

Why Not Get Your Rag Cutter Equipment in Shape Now

A FEW DOLLARS SPENT AT THIS TIME MAY SAVE AS MANY HUNDREDS IN EXPENSIVE SHUT-DOWNS LATER



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Capacity 5 Tons per Hour . . . Main Bearings S.K.F. Roller Type . . . Direct Connection to Motor Through Shearing Flexible Coupling . . . Improved Overhead Swung Feed . . . All Small Bearings Bronze-Graphite Bushed . . . And Alemite Fitted . . . Very Economical of Power . . . Easy of Adjustment . . . Built for hard, continuous Service . . .

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PULP SHREDDERS **DISC CHOPPERS**

LITTLE GIANT PAPER SHREDDERS

ROLL BARS **BED PLATES**

RAG CUTTER KNIVES

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PROGRESS IN THE PAPER INDUSTRY

With this issue the PAPER TRADE JOURNAL presents its Annual Mill Number. Because of business conditions, the material suitable for this issue is naturally more restricted than usual. However, the special articles on new mills and mill improvements, although less numerous than heretofore, do bring out the fact, as have past mill numbers, that none of the great industries are more progressive than the pulp and paper industry.

The story in detail of the building this year of a large new unit at the already extensive plant of the Champion Fibre Company at Canton, N. C., which appears for the first time in print in this issue, will be read with much interest. It is perhaps the most extensive paper mill improvement undertaken during the year on the North American continent and is splendid evidence of the confidence in the future of the American paper industry on the part of outstanding business men. The article on the new insulating board mill of Hawaiian Cane Products, Ltd., at Hilo, Hawaiian Islands, also undoubtedly will be read with more than ordinary interest as it is, perhaps, the most modern mill of this particular type on American soil.

Various other articles also reflect the progressiveness of the industry. These articles in general evidence the growing disposition of paper men to adjust themselves to changing conditions under which more and more is being emphasized the idea of better paper at lower operating cost. The constantly increasing attention that is being devoted to improved technique augurs well for the success of the industry in meeting this challenge.

The article in the Mill Number on the new experimental pulp and paper mill just established under the direction of Dr. Hérty at Savannah, Ga., and the article by Professor Libby on the $50,000 semi-commercial pulp and paper laboratory at the New York State College of Forestry at Syracuse, N. Y., focus attention in a special manner on the importance that is being attached at the present time to the development of the technical side of the industry.

"In whatever field scientific research has been applied logically, consistently and adequately, the net result to everybody concerned, both producer and employee, has been beneficial. Age old barriers of suspicion and trade secrets are giving way to open fields of common scientific knowledge." Thus writes Frank B. Jewett, president of the Bell Telephone Laboratories in *Profitable Practice in Industrial Research.*

A remarkable feature of the depression has been the strength and stability of the Technical Association of the Pulp and Paper Industry. This organization has reflected the progress of the industry in its rise from a rule-of-thumb art to a first rank engineering enterprise, built on a foundation of physics, chemistry and mathematics.

Research work reflects itself in the products which a company makes and sells and should do one or more of the following things: It should reduce the cost of production. It should reduce the operating costs to the user. It should increase the utility of the product. It should increase its sales appeal. It should produce new business and it should determine technical information contributory to some other project.

The ever increasing strength of the Technical Association simply indicates that the pulp and paper industry is beginning to accept the leadership of the engineer and chemist. As might be expected of an industry as old as paper manufacture, the change has been slow and conservative. In fact, the companies supplying machinery and chemicals and the Government and university laboratories have for many years promoted technologic advances in the industry. In the new day that has dawned, however, the industry has begun to develop within itself an inherent desire for progress.

These facts are made manifest by the establishment of the Institute of Paper Chemistry at Appleton, Wis., the research fellowship financed by the American Paper and Pulp Association and the Technical Association of the Pulp and Paper Industry at the Forest Products Laboratory in Madison, the addition of buildings at the New York State College of Forestry in Syracuse, the record-breaking attendance at the recent fall meeting of the Technical Association at Holyoke, the expansion on the Pacific Coast, the awakening of the South, the extremely large number of patents relating to paper manufacture that are being granted and the reorganization of the Technical Association to efficiently meet the manufacturing requirements of the industry.

All these measures indicate the realization by the industry of the fact that a billion dollar enterprise is a very expensive toy and should no longer be run on any trial and error basis. Its successful operation depends on the extent to which it is willing to employ brains that have been intensely disciplined in the study of the engineering

sciences and economics. The growth of TAPPI with its increasing acceleration is a healthy sign and the extent and enthusiasm in which companies are represented in the activities of the Technical Association is likely to be a measure of their likelihood of weathering the storm and paying increasing dividends.

Now is the time for thorough housecleaning—when every man, machine or method should be closely scrutinized in terms of the future—a future that will be dominated by greater manufacturing efficiency and precise standards.

Wood Pulp Tariff Opposed

H. P. Christian, general purchasing agent of the Robert Gair Company, of New York City, and chairman of the Temporary Committee Opposing Tariff on Wood Pulp, has made public a letter written to President Hoover on October 13 in which he states that the result of the proposal of the Oregon and Washington pulp and paper manufacturers to place a tariff duty on wood pulp would be the ruin of hundreds of paper mills in other states. The petition to place a tariff duty on wood pulp was placed before the President on October 12 by E. M. Mills, of Port Angeles, Washington, president of the Washington Pulp and Paper Corporation, on behalf of the pulp and paper manufacturers of Oregon and Washington.

In his letter to the President, Mr. Christian quotes government figures showing that the production of wood pulp on the Pacific Coast in 1930 was 2½ times as great as in 1925, during which period the total United States production showed a normal growth of 17 per cent. This proves, he states, that the Pacific Coast mills have greatly increased their production at the expense of the pulp mills located in other states.

Comparing the present move of the Washington and Oregon mills to the early activities of the power trust he declares that a duty or tax on wood pulp would place the paper industry of the United States in the hands of a few powerful companies which would ruthlessly destroy the smaller companies, thereby resulting in the impoverishment of hundreds of communities, and would deprive thousands of American workmen of their jobs.

Mr. Christian stated that the work of his committee is sponsored by more than 150 manufacturers of paper, operating 236 mills, located in 169 cities and towns in 23 states.

The members of the committee include:

W. H. Anders, President, Nashau River Paper Company, of East Pepperell, Mass.

C. H. Burrows, President, Mohawk Valley Paper Company, of Little Falls, N. Y.

Alexander Calder, President, Union Bag and Paper Company, of New York City, with plants in New York, Wisconsin, Texas, Illinois, Louisiana, and Washington.

E. Victor Donaldson, President, Robert Gair Company, of New York City, with plants in Connecticut, Illinois, Massachusetts and New York.

A. G. Gilman, President, Allied Paper Mills, of Kalamazoo, Mich.

Walker Hamilton, Secretary, Riegel Paper Corporation, of New York City, with plants in New Jersey.

J. W. Kieckhefer, President, Kieckhefer Container Company, of Delair, N. J., with plants in New Jersey, Michigan and Wisconsin.

H. M. Kieckhefer, Secretary-Treasurer, Kieckhefer Container Company, of Delair, N. J., with plants in New Jersey, Michigan and Wisconsin.

J. Kindleberger, President, Kalamazoo Vegetable parchment Company, of Kalamazoo, Mich.

R. C. Mateer, Assistant Treasurer, Scott Paper Company, of Chester, Pa.

W. P. Paepcke, President, Container Corporation of America, of Chicago, Ill., with plants in Illinois, Indiana, Ohio and Pennsylvania.

Z. W. Ranck, President, Crystal Tissue Company, of Middletown, Ohio.

H. Lee Rauch, Vice-President and General Manager, Consolidated Paper Company, of Monroe, Mich., with plants in Illinois and Michigan.

J. L. Riegel, Executive Vice-President and General Manager, Riegel Paper Corporation, of New York City, with plants in New Jersey.

W. R. Shaffer, President, New Haven Pulp and Board Company, of New Haven, Conn.

E. C. Tucker, Vice-President, Chemical Paper Manufacturing Company, of Holyoke, Mass.

G. R. Wallace, President, Fitchburg Paper Company, of New York City, with plant in Massachusetts.

English Clay Producers Merge

Plans have been completed for the consolidation of three leading clay producers of Cornwall, England, comprising Lovering China Clays, Ltd., English China Clays, Ltd., and H. D. Pochin & Co., Ltd., all represented in the United States, and prominent in the furnishing of filling and coating clays for the American and Canadian paper trade. The new organization will be known as English Clays, Lovering, Pochin & Co., Ltd., and will take over all the clay lands now leased or occupied by the three companies, as well as other assets of the organizations, including subsidiary and allied interests. The capitalization of the amalgamated company is now being determined; it is proposed to dispose of 100,000 preference shares of the new capital stock for cash at par value, to provide necessary working capital, and the different associated interests will subscribe for such stock issue. Assets of the consolidated company are to be valued by Gerald Eve & Co., London, an appraisal organization. Hon. Henry D. McLaren, head of H. D. Pochin & Co., Ltd., will be first chairman of the amalgamated organization, while Mr. Martin, heretofore connected with English China Clays, Ltd., will be managing director.

Carthage Mill May Reopen

[FROM OUR REGULAR CORRESPONDENT]

CARTHAGE, N. Y., October 22, 1932—The local Chamber of Commerce voted this week to cooperate with the prominent business men sponsoring the plan to reopen the plant of the Carthage Pulp and Board Company. A statement issued by directors declared that the plan had been investigated and found to be thoroughly honest and feasible. The organization recommends the plan to residents of the village and has offered its clerical facilities in conducting a campaign now under way for subscriptions in stock to finance the project.

Announcement was made this week at a meeting of those identified with the plan that $7,500 is necessary before operations can be started and it is proposed to raise this capital from local residents as far as is possible. Bert W. Thomas, formerly office manager of the Carthage Pulp and Board Company, is leading the movement to reopen the plant which will have an output of about 16 tons of high grade paper daily. It is expected that about 35 hands will be given employment at the start.

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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

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Machinery

Method and apparatus for screening pulp. M. Thiry Belg. pat. 382,805 (Oct. 31, 1931).—The screen drum is divided into several compartments constructed so that the water which has been used to clean the screening surface of one compartment is led into the next one where it passes through the screen plates along with the good fibers recovered from the tailings of the preceding compartment. —A. P.-C.

Device for centrifugal pulp-cleaning Apparatus. Société des Anciens Etablissements Cime and D. Perrier. Belg. pat. 382,858 (Oct. 31, 1931).—The rotating bowl is provided at the top with concentric circular partitions forming passages for the heavy impurities, clean stock and light impurities, respectively. The cross sections of the passages can be adjusted from the outside of the machine by displacement of the partitions.—A. P.-C.

Controlling paper machine operation. Dozier Finley assignor to Toledo Scale Manufacturing Co. U. S. pat. 1,857,275 (May 10, 1932).—The operation of the paper machine is controlled to produce a uniform product by continuously weighing the paper as it is delivered from the machine, utilizing the weighing machine with means for recording the weight per unit length, and adjusting the speed of the machine in accordance with the indications of the weighing machine.—A. P.-C.

Sheet formation control. L. M. Booth. Paper Trade J. 94, No. 23: 52-53 (June 9, 1932).—A brief discussion of the importance of controlling the quality of the water used at the paper machine in order to obtain proper sheet formation.—A. P.-C.

Downington extractor for cylinder machines. C. H. R. Johnson. Paper Mill 55, No. 19, 8, 12, 14 (May 7, 1932); Paper Trade J. 94, No. 23: 65-66 (June 9, 1932). —A description of the device (consisting of a wire-faced bottom roll and weighted rubber-covered cast iron top roll, the unit being located between the last vat and the whipper stand for the top felt) and of the performance of a number of installations on different board machines.—A. P.-C.

Conversion of Cigaret Papers. F. Leven. Industrie Papetiere 11:135 (May, 1932).—A brief description of machines used for the conversion of rolls of cigaret paper into small rolls for cigaret making machine or into sheets for individual cigarets.—A. P.-C.

Vacuum Pumps in the Paper Industry. Carlo Vicario. Paper Trade J. 94. No. 24:41-42 (June 16, 1932).—A brief analysis of the function and performance of suction pumps used in connection with paper machines.—A. P.-C.

Rotary Digester. Arthur E. Millington assignor to The U. S. National Bank of Portland, Ore., as trustee, U. S. pat. 1,857,317 (May 10, 1932).—The digester is constructed so that hot water is automatically injected into it at each rotation and part of the liquid contents of the digester are allowed to escape at each rotation.—A. P.-C.

Auxiliary Reels for Paper Machines. Harry M. Ross assignor of one-half to Beveridge Paper Co. U. S. pat. 1,865,279 (June 28, 1932).—An auxiliary reel is provided on which the paper is wound during temporary interruption of the cutting mechanism. When the cutter is again in operation, the web is shunted past the auxiliary reel, the latter is turned end for end in the same horizontal plane in which the paper is wound, and the paper on the auxiliary reel is fed to the cutter along with the main web.—A. P.-C.

Wet Machine for Insulating Board. John A. Wiener and John B. Harmon. U. S. pat. 1,864,784 (June 28, 1932).—The sheet is formed on a wire-screen-covered cylinder mold and transferred between a pair of fourdrinier wires which are driven at the same speed as the peripheral speed of the cylinder mold, and which carry the sheet through one or more presses. Suction boxes are provided under the bottom fourdrinier wire.—A. P.-C.

Jones Rotary Inward Flow Screen. Anon. Paper Trade J. 94, No. 25:15 (July 23, 1932).—A description of the Jones rotary inflow screen, which is an improvement over the Leith Walk screen, bringing out its merits. A. P.-C.

Direct Chlorination As An Aid In The Bleaching of Sulphate Pulp*

John D. Rue[1] and James S. Sconce[2]

Summary

The rate of reaction of chlorine on pulp proceeds extremely rapidly for the first two or three minutes, then drops quickly to a very slow rate. Temperature and consistency modify these rates of reaction to only a moderate extent.

The addition of lime after the first few minutes increases the rate of reaction for a limited time and prevents serious chemical and physical degrading of the pulp.

A two stage laboratory bleaching process has been developed the first stage of which consists of direct chlorination for a period of five minutes, alkalizing with lime and allowing the remaining available chlorine to exhaust. The second stage is a typical hypochlorite bleach.

Data are presented showing the effect of various proportionings of chlorine between stages on the chemical and physical properties of pulps.

Bleaching data and pulp properties are given for several full bleached kraft pulps.

The bleaching process has been developed on a commercial scale, details of equipment and process are described.

Introduction

The introduction during the past two or three years of direct chlorination as a practical step in the process of bleaching constitutes, in our estimation, the greatest advance which has been made in many years in the bleaching of chemical wood pulp. As applied to sulphite pulp it results in remarkable savings in chlorine and lime and in improvement in chemical and physical properties. Similar results follow its use with soda pulps.

The use of direct chlorination with sulphate pulps, however, is especially noteworthy. It has made it possible, for the first time, to bleach sulphate and even hard bleaching kraft pulps in a simple two stage operation and secure products at least as white as commercially bleached soda pulps and having a strength almost equal to that of the unbleached pulp.

There are many reasons, economically and technically why it is desirable to produce strong white sulphate pulps. We shall assume that you agree in general with the assertion and that your interest will permit us to go directly to a discussion of ways and means of securing the desired product without elaboration at this time of the questions involved in the use and application of the product.

Direct chlorination as an aid to the production of a purified, white pulp is not new either scientifically or commercially. A process consisting essentially of a sequence of steps which include, first, chlorination, second, washing with a cold dilute alkali, and third, bleaching with a hypochlorite, was patented by DeVains in France in 1912 (*1*) and in the United States in 1914 (*2*). This process seems however, to have been completely and in detail, anticipated in a French publication in 1874 (*3*) which describes the bleaching both of straw and of soda wood pulps. In that description it is interesting to note that reference is made to a still earlier description dating as far back as 1830 (*4*). Chlorination bleaching is, therefore, as you can see, merely a revival of an old idea.

In 1923 Emil Heuser (*5*) published a detailed description of some experiments which he and his assistants conducted using the process outlined by DeVains in the bleaching of sulphite pulp. Heuser shows savings of chlorine as compared with a single stage bleach of as high as 50 per cent and with improved color.

Michel Jaffard in France had applied the chlorination bleaching to sulphate cooked Maratime pine pulp and in 1924 (*6*) reported very favorable results.

In a recent report (*7*) from the Forest Products Laboratory, sulphate cooking was modified so as to give a relatively easy bleaching pulp. The pulp was then bleached by a process which involved a direct chlorination step. Application of a combination of these modified processes to pine wood resulted in a strong, and at the same time, white pulp which promises to compete in quality with bleached sulphite pulp for many purposes.

Several years ago Drewsen (*8*) disclosed a direct chlorination step in his process for bleaching pulp cooked with neutral sodium sulphite.

We see then that in the technical and patent literature there are sponsors for chlorination bleaching as applied to the entire gamut of chemically cooked pulps including soda, sulphite, easy bleaching sulphate, kraft and neutral sulphite. The discussion will be limited, however, to the application of chlorination to sulphate pulps. The recent interest in chlorination bleaching and its successful commercial application is due very largely, we believe, to newer developments in materials for equipment construction, which are resistant to the corrosive action of dilute solutions of hydrochloric acid and chlorine and to those chemicals alternated with cold dilute alkalies.

We shall first discuss the results of some laboratory studies dealing with the technical factors underlying the chlorination of sulphate pulp and then present in detail a process for practical commercial chlorination as applied to bleaching.

Laboratory Chlorination Studies

After some consideration as to the pulp to be used to demonstrate the chlorination step, we decided to use Stora light and strong sulphate and Sandviken kraft pulps. Stora sulphate is an easy bleaching, soft sulphate pulp of uniform quality and strength, sometimes imported into this country for semi-bleaching. Sandviken kraft is a strong extremely hard bleaching kraft, mainly imported for use in cable wrapping, gumming tape and strong kraft specialties. Almost any sulphate pulp considered for bleaching will fall between the extremes of these two pulps.

Chlorinations were carried out in stoneware jars provided with wooden covers. Four or eight hundred gram batches of pulp were treated with chlorine water carrying the desired amount of available chlorine, at 3 per cent consistency unless otherwise noted and within the temperature limits recorded on the figures. Manual agitation was vigorous until thorough mixing had been secured. Thereafter it was intermittent.

Rate of Chlorination

The shape of curves plotting the percent of unconsumed

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* Presented at the fall meeting of the Technical Association of the Pulp and Paper Industry, Holyoke, Mass., September 14-16, 1932.

[1] Member TAPPI, chemical engineer, Hooker Electrochemical Company, Niagara Falls, N. Y.

[2] Chemist, Hooker Electrochemical Company.

TABLE I
THE EFFECT ON THE CHEMICAL QUALITY OF PULP OF VARYING CHLORINE DOSAGE

Temperature 20-25 deg. C. Consistency 3 per cent.

Number	Chlorine Added per cent	Chlorine Consumed per cent	Period of chlorination minutes	Alpha cellulose per cent	Insoluble in 7.14 per cent NaOH per cent	Copper number
Sandviken Kraft						
190C3	10	9.9	240	84.2	77.5	3.1
190C5	13	12.4	420	82.0	71.2	4.8
190C7	16	14.6	480	82.6	70.2	6.0
Stora Sulphate						
191C2	2	2.0	20	89.2	88.4	2.4
191C4	4	3.9	180	87.3	81.1	2.8
191C6	6	5.6	360	86.9	75.7	3.4

TABLE II
THE EFFECT ON CHEMICAL QUALITY OF PULP OF VARYING TEMPERATURE

Consistency 3 per cent. Chlorine dosage 16 per cent for Sandviken Kraft and 6 per cent for Stora sulphate.

Number	Temperature deg. C.	Chlorine consumed per cent	Period of chlorination minutes	Alpha cellulose per cent	Insoluble in 7.14 per cent NaOH per cent	Copper number
Sandviken Kraft						
190C13	5-10	13.0	450	85.7	76.4	4.1
190C7	20-25	14.6	480	82.6	70.2	6.0
190C9	28-32	14.6	360	81.6	63.8	5.4
190C11	37-43	15.5	300	71.2	54.6	8.9
Stora Sulphate						
191C14	5-10	4.8	360	88.6	83.8	2.0
191C6	20-25	5.6	360	86.9	75.7	3.4
191C10	28-32	5.9	240	82.0	68.7	4.3
191C12	45-47	5.7	70	78.5	62.3	6.9

TABLE III
THE EFFECT ON CHEMICAL QUALITY OF PULP OF VARYING CONSISTENCY

Temperature 20-25 deg. C. Chlorine dosage 16 per cent for Sandviken Kraft and 6 per cent for Stora sulphate.

Number	Consistency per cent	Chlorine consumed per cent	Period of chlorination minutes	Alpha cellulose per cent	Insoluble in 7.14 per cent NaOH per cent	Copper number
Sandviken Kraft						
190C15	1	14.2	360	77.9	65.0	6.6
190C7	3	14.6	480	82.6	70.2	6.0
190C17	4.85	15.6	300	86.1	75.6	3.5
Stora Sulphate						
191C16	1	4.9	360	87.1	76.7	3.1
191C6	3	5.6	360	86.9	75.7	3.4
191C18	5	5.8	180	88.5	77.6	2.6

chlorine against the time of reaction, disclosed some surprising facts about the rate of chlorination. (See Fig. 1). During the first two minutes of reaction, or almost as rapidly as the pulp and chlorine could be well mixed, 50 per cent or more of the chlorine was consumed. Then the rate of chlorination quickly dropped, thereafter decreasing slowly until final exhaustion of the available chlorine was reached. The curves are clearly indicative of two reactions, the first extremely rapid and the second very slow.

Comparison of the curves for the hard, strong kraft and for the soft sulphate is striking, despite the fact that extremely different amounts of chlorine were consumed. Both pulps show the very rapid consumption of a large proportion of chlorine in the first few minutes, then the long drawn out consumption of the remaining chlorine.

This similarity of the shape of the chlorination curve

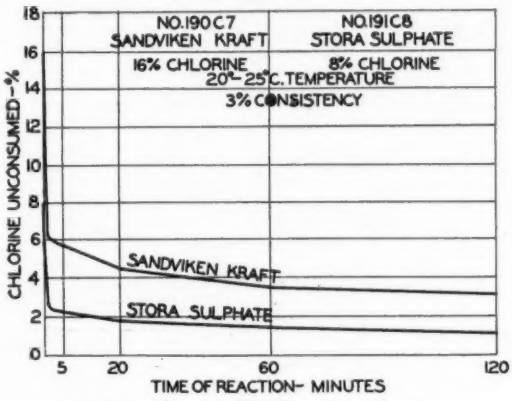


FIG. 1
Rate of chlorine consumption during chlorination.

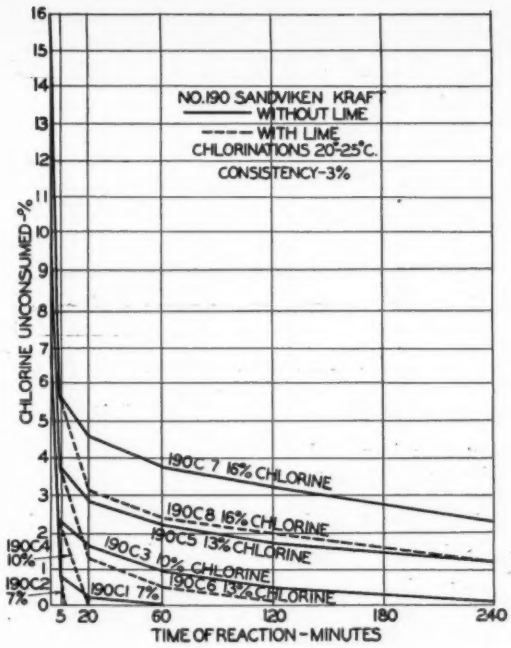


FIG. 2 A
Effect of variable chlorine dosage on rate of chlorination.

is further established by the solid curves for various original additions of chlorine ranging from 2 to 6 per cent on Stora pulp, Fig. 2B, and from 7 to 16 per cent on Sandviken pulp, Fig. 2A.

Within limits, the law of mass action applies to these curves, greater additions of chlorine at the start of the reaction producing greater consumption of chlorine in a given period of time. The obtainable variation, however, is only a moderate fraction of the total consumption.

It was noted, as was to have been expected, that temperature and pulp consistency appreciably influence the rate of reaction. The effect of temperature is indicated by the curves of Fig. 3 A and B. Decreasing the temperature decreased the rate of chlorine consumed. On the Stora sulphate a decrease of 40 deg. C. increased the chlorination time from 70 minutes to well over 360 min-

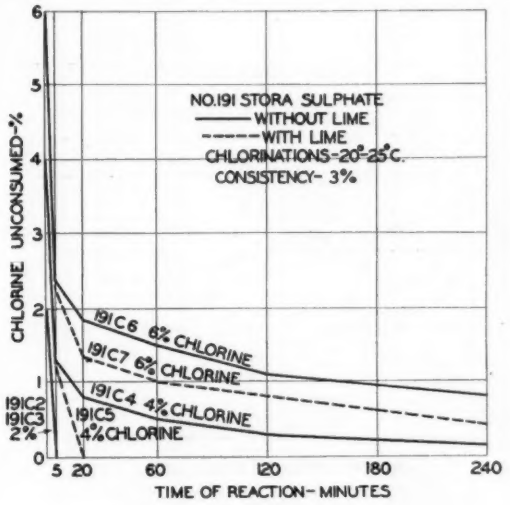


FIG. 2 B
Effect of variable chlorine dosage on rate of chlorination.

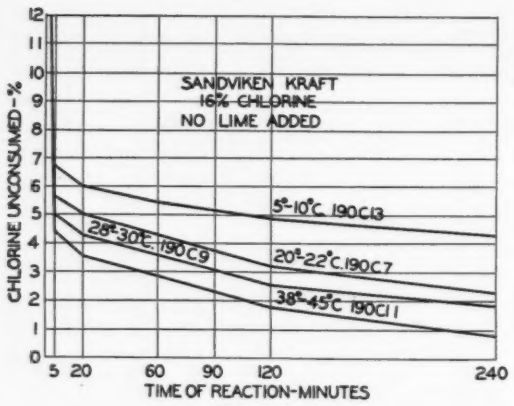


FIG. 3 A

Effect of variation in temperature on rate of chlorination.

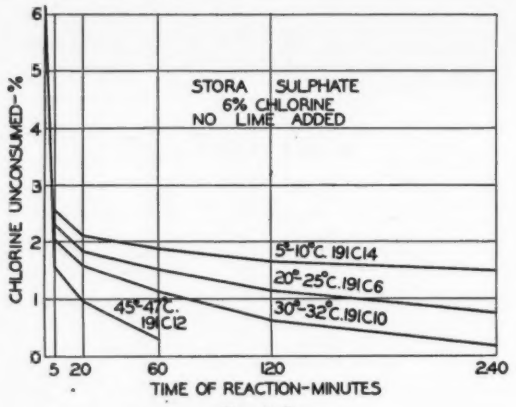


FIG. 3 B

Effect of variation in temperature on rate of chlorination.

utes, but only decreased the amount of chlorine consumed in 5 minutes, 30 per cent. The general shape of the curves remained the same.

The influence of consistency on rate of reaction is clear from the curves presented in Fig. 4 A and B. Increasing the consistency increased the rate of reaction. Variations in rate of reaction as a result of minor consistency and temperature fluctuations, are not of major importance in controlling chlorination in practical mill operation, but they are not to be neglected.

A study was made of the effect of varying dosage of chlorine, temperature and consistency on the chemical properties of the chlorinated pulp as measured by content of alpha cellulose (*9*), 7.14 per cent NaOH insolubility *(10)* and copper number *(10)*. Attention is drawn to the fact that after chlorination, in no case extending over 8 hours and usually stopped at 6 hours if not exhausted before that time, the pulps were washed free of reactant substances with water. Alkali was not used to neutralize the acid formed during the chlorination process.

Increasing the chlorine dosage increased the period of reaction and injured the chemical quality of the chlorinated pulp. See Table I. Increasing temperature of chlorination decreased the time of reaction but injured quality of pulp. See Table II. Increasing consistency of chlorination decreased time of reaction and improved quality of pulp. See Table III.

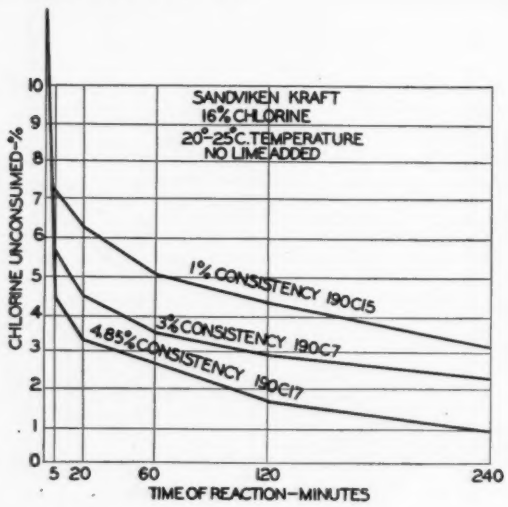


FIG. 4 A

Effect of variation in consistency on rate of chlorination.

ADDITION OF ALKALI

The chlorination of pulps containing lignin results in the formation of water insoluble products. The technical literature records a number of ways by which these materials may be extracted from the pulp, such as cold extraction with sodium or calcium hydroxide, and hot extraction with sodium carbonate, sodium sulfite, sodium bisulfite, or their mixtures. Probably any soluble alkali will extract these so called chlor-lignins but for purely economic reasons, we have limited our discussion to the use of calcium hydroxide.

A study of the previous curves and chemical data brought us to the theory that possibly the major value of the chlorination had been obtained during the first few minutes of reaction, that the prolonged period of reaction required for the exhaustion of the remaining chlorine might be materially reduced and the product improved if the residual available chlorine were converted into calcium hypochlorite through the addition of alkali after the first few minutes of reaction. We knew of course, that the presence of free alkali even in the cold would dissolve the chlorinated incrustants.

Chlorinations were therefore run adding different amounts of chlorine to the pulp. After five minutes of reaction, lime was added in quantity sufficient to neutralize the acids formed, to convert the remaining available

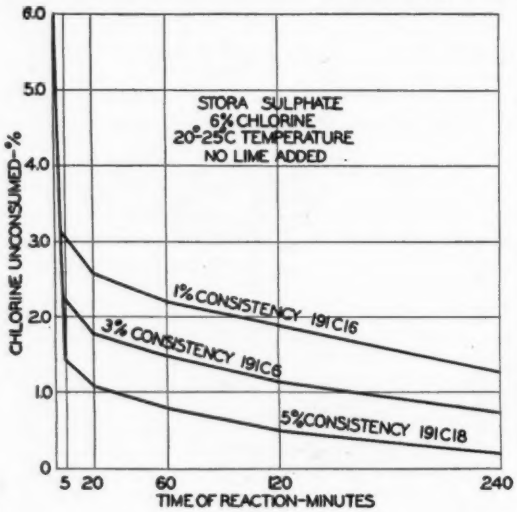


FIG. 4 B

Effect of variation in consistency on rate of chlorination

TABLE IV

THE EFFECT OF VARYING CHLORINE DOSAGE ON CHEMICAL PROPERTIES OF THE CHLORINATED PULP

Temperature 20-25 deg. C. Consistency 3 per cent. Alkali added after 5 minutes to pH> 8.

Number	Chlorine: Added per cent	Chlorine consumed: In acid stage per cent	Chlorine consumed: As hypochlorite per cent	Alpha cellulose per cent	Insoluble in 7.14 per cent NaOH per cent	Copper number
Sandviken Kraft						
190C4	10	7.6	2.4	87.7	83.9	2.3
190C6	13	8.9	4.1	87.2	83.3	1.5
190C8	16	10.2	4.8	86.4	83.7	1.6
Stora Sulphate						
191C3	2	1.9	0.1	89.2	89.0	2.1
191C5	4	2.8	1.2	88.8	...	1.8
191C7	6	3.5	2.1	88.4	87.9	1.6

chlorine to hypochlorite and to dissolve out chlorinated incrustants. Operation of chlorinations by this method produced the following results as compared with the results of chlorinations without lime.

(a) The time required to exhaust a definite amount of chlorine was materially reduced. See the broken lines of Fig. 2 A and B.

(b) Increasing the chlorine dosage produced only a negligible effect on the chemical quality of the pulp. See Table IV.

(c) The effect of temperature and consistency on the rate of reaction was not materially altered. See Figs. 5 A and B and Figs. 6 A and B.

(d) The trend of the effect of temperature and consistency on chemical properties was not altered. The extent of the injury was, however, greatly reduced. See Table V and VI.

In the case of the Sandviken pulp, an increase in temperature of 32 deg. C. resulted, when lime was used, in a reduction of the alpha content of 2.2 per cent, a reduction of the alkali insoluble content of 3.5 per cent and an increase of the copper number of 0.4 per cent. The figures, when lime was not used, were 14.5, 22.0 and 4.9

TABLE V

THE EFFECT OF VARYING TEMPERATURE ON CHEMICAL PROPERTIES OF CHLORINATED PULP

Consistency 3 per cent. Chlorine dosage 16 per cent for Sandviken kraft and 6 per cent for Stora sulphate. Alkali added after 5 minutes to pH> 8.

Number	Temperature deg. C.	Chlorine consumed: In acid stage per cent	Chlorine consumed: As hypochlorite per cent	Alpha cellulose per cent	Insoluble in 7.14 per cent NaOH per cent	Copper number
Sandviken Kraft						
190C14	5-10	9.7	3.3	88.5	84.6	1.4
190C8	20-25	10.2	4.8	86.4	83.7	1.6
190C10	28-32	10.5	5.0	87.0	81.9	1.3
190C12	37-43	11.4	4.3	86.2	81.1	1.8
Stora Sulphate						
191C15	5-10	3.4	1.7	88.1	87.9	1.3
191C7	20-25	3.5	2.1	88.4	87.9	1.6
191C11	35-38	4.1	1.7	86.4	84.2	1.6
191C13	45-47	4.4	1.6	86.8	81.6	1.8

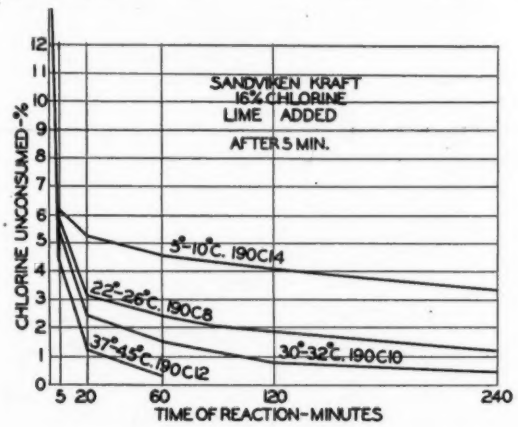


FIG. 5 A

Effect of variation in temperature on rate of chlorination.

TABLE VI

THE EFFECT OF VARYING CONSISTENCY ON CHEMICAL PROPERTIES OF CHLORINATED PULP

Temperature 20-25 deg. C. Chlorine dosage 16 per cent for Sandviken kraft and 6 per cent for Stora sulphate. Alkali added after 5 minutes to pH>8.

Number	Consistency per cent	Chlorine consumed: In acid stage per cent	Chlorine consumed: As hypochlorite per cent	Alpha cellulose per cent	Insoluble in 7.14 per cent NaOH per cent	Copper number
Sandviken Kraft						
190C16	1	...	..	87.5	82.8	1.4
190C8	3	10.2	4.8	86.4	83.8	1.6
190C18	4.85	10.9	4.6	88.6	83.7	1.3
Stora Sulphate						
191C17	1	2.9	2.5	87.6	86.5	1.4
191C7	3	3.5	2.1	88.4	87.9	1.6
191C19	5	4.5	1.5	89.9	86.7	1.1

* Total 14.7 per cent.

per cent respectively. The effects of varying the dosage from 10 to 16 per cent and the consistency from 1 to 5 per cent, were, when lime was used, so far reduced that they may be disregarded from the standpoint of commercial application.

Further to compare the two methods, chlorinations were run so that the same amount of chlorine was consumed during the actual chlorination period. Both chemical and physical strength tests were made on the resultant pulps. See Table VII and Fig. 7. Despite the additional alkaline bleaching of the chlorinations when lime was added after 5 minutes, this type of chlorination produced in every case pulp which in chemical quality and in physical strength was superior to that produced by the chlorinations without lime.

Chlorine-Hypochlorite Bleaching—Laboratory Scale

THE PROCESS

From the above data and data published by previous workers in the field, we developed a laboratory process for bleaching kraft pulp. The process consists of two

TABLE VII

A COMPARISON OF CHEMICAL QUALITY OF PULP CHLORINATED WITH AND WITHOUT LIME AFTER 5 MINUTES OF REACTION USING APPROXIMATELY EQUAL AMOUNTS OF CHLORINE IN THE ACID STAGE

Consistency 3 per cent

Number	Chlorine: Added per cent	Chlorine consumed: In acid stage per cent	Chlorine consumed: As hypochlorite per cent	Lime used per cent	Temperature deg. C.	Alpha cellulose per cent	Insoluble in 7.14 per cent NaOH per cent	Copper number
Sandviken Kraft								
190C21	9.5	9.5	0	0	5-10	87.3	84.0	3.2
190C14	16.0	9.7	3.3	19.2	5-10	88.5	84.6	1.4
190C3	10.0	10.0	0	0	20-25	84.2	77.5	3.1
190C8	16.0	10.2	4.8	19.2	20-25	86.4	83.7	1.6
190C19	10.7	10.7	0	0	28-32	...	73.7	4.1
190C10	16.0	10.5	5.0	19.2	28-32	87.0	81.9	1.3
Stora Sulphate								
191C23	3.4	3.4	0	0	5-10	90.5	87.9	2.2
191C15	6.0	3.4	1.7	7.2	5-10	88.1	87.9	1.3
191C21	4.0	3.8	0	0	28-32	86.6	79.2	2.5
191C11	6.0	4.1	1.7	7.2	35-38	86.4	84.2	1.6

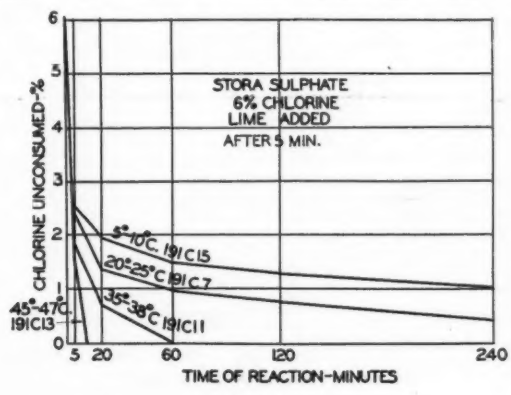


FIG. 5 B

Effect of variation in temperature on rate of chlorination.

stages, the first, a chlorination of 5 minutes after which lime is added and the reaction allowed to proceed in an alkaline medium substantially to exhaustion of the chlorine; the second, a calcium hypochlorite bleach using a relatively small proportion of available chlorine, both stages followed by thorough washing.

Briefly outlined the process is as follows:

1. Thoroughly mix in a stoneware crock the desired amount of pulp with chlorine water containing the desired amount of chlorine and water in quantity sufficient, and temperature suitable, to produce a predetermined consistency and a predetermined temperature.

2. After 5 minutes chlorination, add calcium hydroxide in quantity sufficient to produce an alkalinity of approximately pH 8, thus neutralizing the hydrochloric acid formed and converting the remaining available chlorine to calcium hypochlorite.

3. Allow the available chlorine to exhaust and wash thoroughly. If the chlorine has been properly proportioned, it will be practically exhausted in from 60 to 120 minutes after addition of lime, depending on the temperature.

4. Mix the washed chlorinated pulp in a stoneware crock with water and calcium hypochlorite solution in predetermined quantities and at a predetermined temperature and bleach to practical exhaustion of the available chlorine. Then thoroughly wash. Usually from four to six hours of bleaching time will be required depending on the temperature and consistency variables.

Proportioning the Chlorine in the Two Stages

A series of two stage bleaches were carried out on the two pulps by the laboratory method just described, varying the amount of chlorine used in the first stage and bleaching with hypochlorite in the second stage to approximately the same color. The Ives tintphotometer readings for the pulps are presented in Table VIII. The Stora pulps are a few degrees lighter in color than the Sandviken pulps. All eight of the bleaches are equal or superior in color to most bleached soda pulps.

In Table IX are presented the bleaching and chemical data for these pulps. Those bleached with the lowest amount of available chlorine in the second stage, have the highest chemical quality. The strength tests of the pulps (see Fig. 8 A and B) definitely indicate the superiority of the pulps using the least amount of available chlorine in the second stage. Increasing the proportion of chlorine used in the first stage until the amount required to bleach to color in the second stage is less than 1 per cent, appreciably improves the physical strength and chemical quality of the pulp, but increases the consumption of chlorine and lime to a small extent over the minimum possible for a given color.

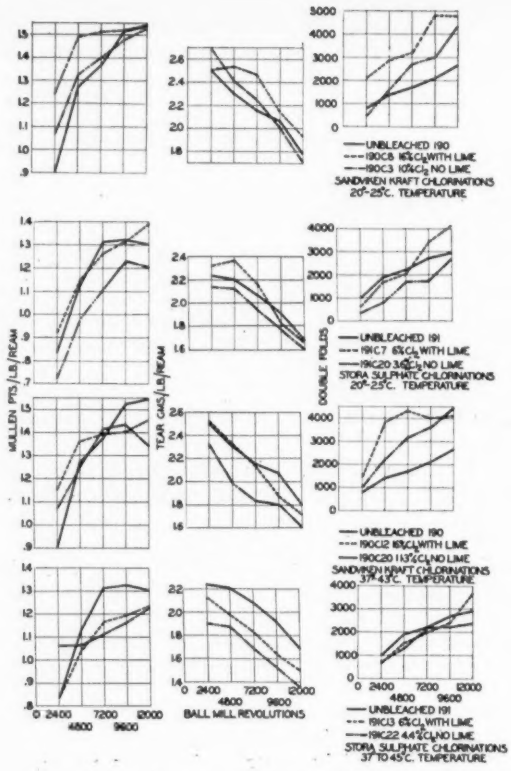


Fig. 7

Comparison of physical strength of pulps produced by the two chlorination methods.

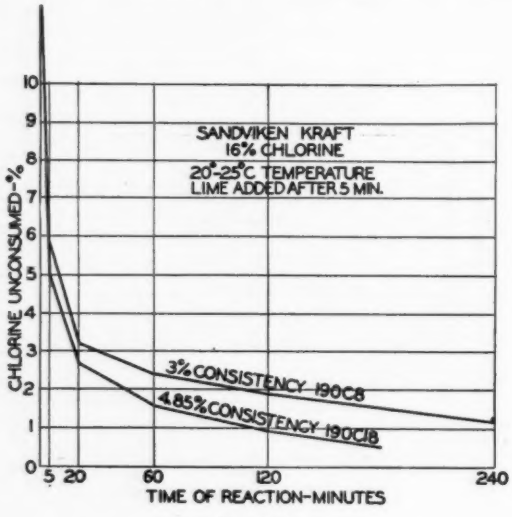


Fig. 6 A

Effect of variation in consistency on rate of chlorination.

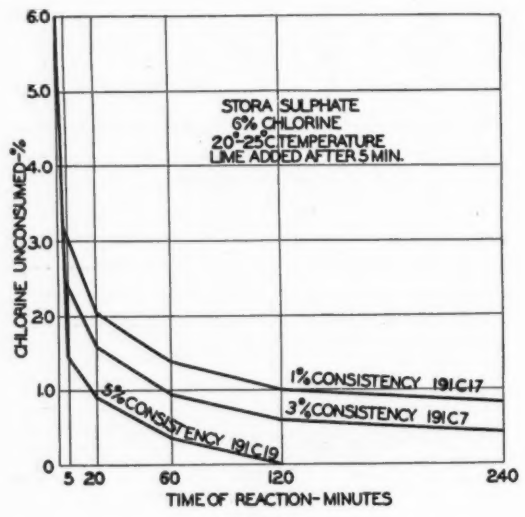


Fig. 6 B

Effect of variation in consistency on rate of chlorination.

TABLE VIII
COLOR MEASUREMENTS OF FULL BLEACHED SANDVIKEN KRAFT AND STORA SULPHATE

Number	Ives tintphotometer reading			Luminosity values calculated			
	Blue	Green	Red	White	Yellow	Red	Black
Sandviken Kraft							
190CB4	80.0	84.5	94.0	80.0	4.1	1.8	14.1
190CB5	82.2	87.0	92.0	82.2	4.3	1.0	12.5
190CB6	81.5	87.3	94.0	81.5	5.2	1.3	12.0
190CB7	84.8	87.5	93.0	84.8	2.4	1.0	11.8
Stora Sulphate							
191CB2	84.5	88.7	95.0	84.5	3.8	1.2	10.5
191CB3	84.5	89.0	96.0	84.5	4.1	1.3	10.1
191CB6	85.5	87.7	95.0	85.5	2.0	1.4	11.1
191CB5	82.8	88.7	95.0	82.8	5.3	1.3	10.6

Bleaching Typical Sulphate Pulps

A large number of chlorination bleaches have been made on imported and domestic sulphate pulps. Bleaching data, Ives tintphotometer color readings and chemical data for a few typical ones, are presented in Table X. The physical strengths of the bleached and unbleached pulps are presented in Fig. 9.

In only one case, that of the Gutzeit pulp, is the bursting and folding strength appreciably below the unbleached pulp strength. Tearing strengths in some cases equal the unbleached and in others are as low as 0.8 gram per pound per ream below the unbleached pulp, but in every case they are equal or superior to Mitscherlich sulphite pulps, several of which have been tested in our laboratory.

Commercial Chlorine-Hypochlorite Bleaching

The chlorination bleaching process has also been developed on a commercial basis and consists of one or more chlorination stages followed finally by a hypochlorite stage. The pulp is thoroughly washed after each stage. The hypochlorite stage can be carried on by any of the recognized methods in commercial practice. It can be designed either as high or low density and operated continuously or batchwise according to the preference of the manufacturer and the local conditions in the mill.

The Chlorination

The chlorination stage, however, requires especial attention. That stage, as regards both process and equipment, has been designed with a view to the attainment of several important objectives chief of which are as follows:

1. Injection of the chlorine into the pulp under pressure in a closed vessel and maintaining a pressure until after the addition of alkali.

2. Prompt and vigorous mixing of chlorine and pulp and

TABLE IX
VARYING THE PROPORTION OF CHLORINE IN THE TWO STAGES OF A CHLORINE-HYPOCHLORITE BLEACH
Chlorination stage: Alkali added after 5 minutes to pH>8. Temperature 20-25 deg. C. for Stora Sulphate and 25 to 30 deg. C. for Sandviken Kraft. Consistency 3 per cent. Hypochlorite stage: Temperature 30-35 deg. C. Consistency 5 per cent.

Lab. No.	Chlorination stage				Hypochlorite stage			Both stages		Chemical properties		
	Chlorine				Chlorine			Chlorine				
	Added per cent	Consumed: In acid stage per cent	Consumed: As hypochlorite per cent	Period to exhaustion minutes	Added per cent	Consumed per cent	Period of bleaching minutes	Added per cent	Consumed per cent	Alpha cellulose per cent	Insoluble in 7.14% NaOH per cent	Copper number
Sandviken Kraft												
190CB4	7.0	6.4	0.6	10	8.0	7.7	300	15.0	14.7	75.2	59.4	5.2
190CB5	10.0	8.2	1.8	10	5.5	4.9	305	15.5	14.9	79.8	60.3	4.7
190CB6	13.0	9.5	3.5	60	3.0	2.4	300	16.0	15.4	83.5	68.1	2.9
190CB7	16.0	10.9	4.4	160	0.8	0.6	300	16.8	15.9	87.3	78.6	1.6
Stora Sulphate												
191CB2	3.0	2.6	0.4	10	4.0	3.6	360	7.0	6.6	79.5	62.3	4.6
191CB3	4.0	3.1	0.9	30	3.0	2.7	360	7.0	6.7	80.0	66.1	3.7
191CB6	5.0	3.5	1.5	60	2.3	1.8	360	7.3	6.8	83.7	67.1	3.5
191CB5	6.0	3.8	1.9	120	1.5	1.3	360	7.5	7.0	83.7	70.6	3.0

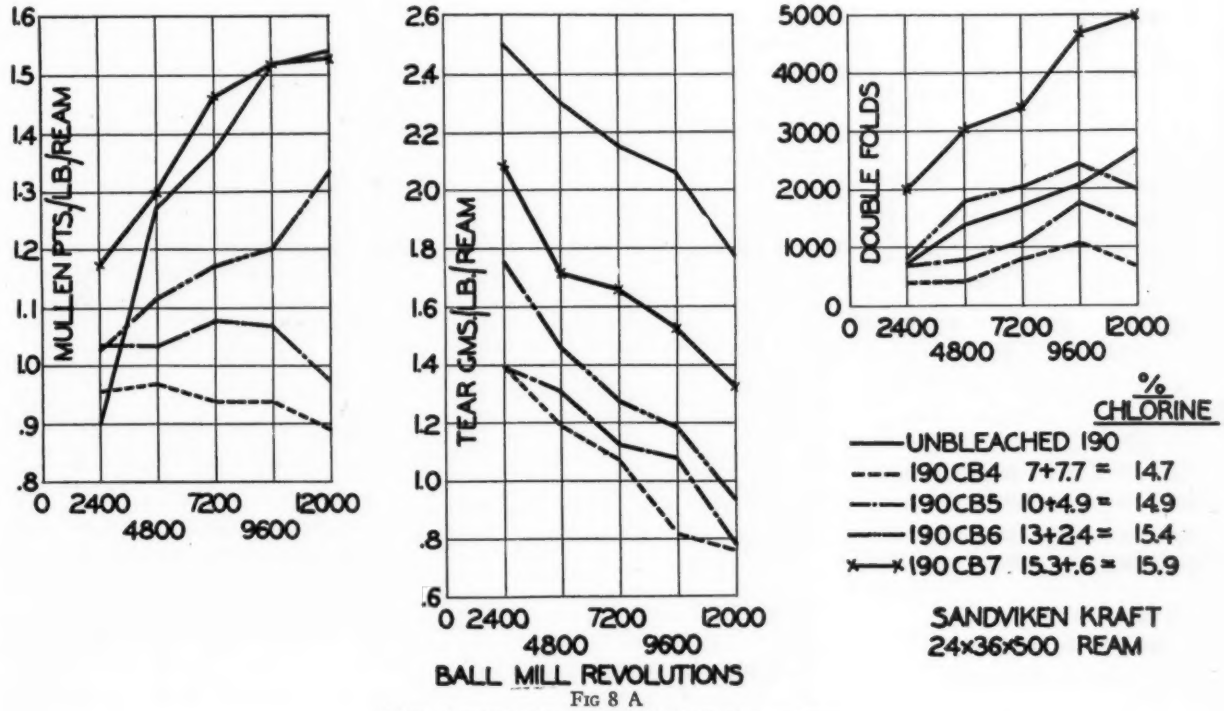


FIG 8 A
Effect of proportioning available chlorine in the two stages.

continued agitation until the chlorine is dissolved and uniformly distributed in the pulp.

3. Provision for a relatively quiet period of reaction in the acid stage of from 5 to 20 minutes.

4. Prompt conclusion of the acid period by the addition of an alkali and prompt and thorough mixing of alkali and pulp.

5. Provision for a relatively quiet period of about one hour for exhaustion of the hypochlorite formed by the interaction of the alkali and the residual available chlorine.

6. Elimination of moving parts and bearings in the equipment handling the acid stage.

7. Construction of equipment simple in design and thoroughly resistant to the corrosive action of acid and chlorine.

8. Positive and intelligent proportioning of both chlorine and alkali to pulp.

These objectives have been attained in equipment which necessarily had to be designed especially for the purpose. Details of the process and equipment will be clear from a description of a typical two stage unit designed for a nominal capacity of 60 tons per day. See Fig 10 for a flow diagram of the process.

The stock is drawn from a brown stock chest and fed to the chlorinator by either a centrifugal or a plunger pump. Chlorine is injected continuously into the pulp and the mass forced through a baffled path during the passage of which mixing is maintained over an appreciable length of time by virtue of the turbulent flow of the stock. The turbulence is set up as a result of the velocity given the stock by the feed pump. The chlorine and pulp move downward during the mixing period so as to reduce the tendency of undissolved bubbles to pass forward with the pulp. When solution of the chlorine and mixing with the pulp have been completed the acid stock discharges into the bottom of a small tower 4 feet in diameter and 15 feet high. Passage of the stock upward through this tower requires the necessary period, usually 5 minutes, for continuing the chlorination reaction. The period of retention, and consequently the size of this tower, may be increased in some cases where special quality specifications of the

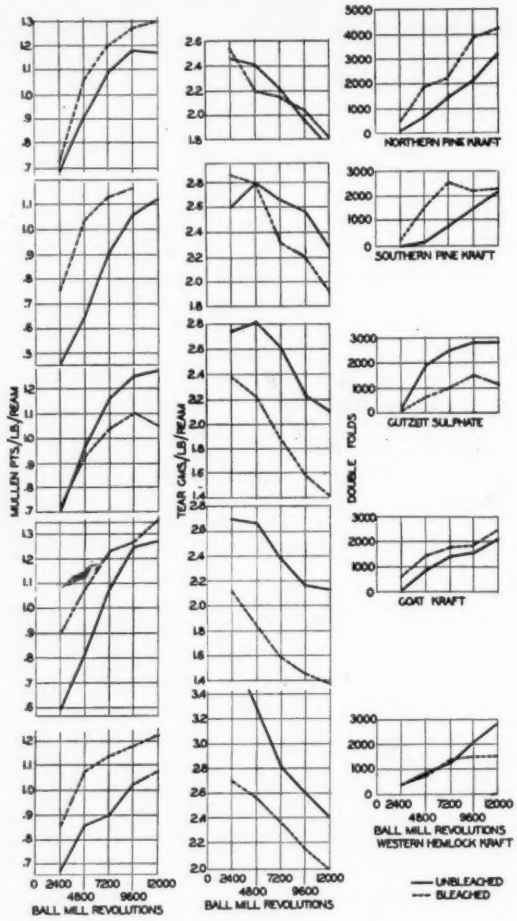


FIG. 9

Physical strengths for typical unbleached and chlorine hypochlorite bleached krafts.

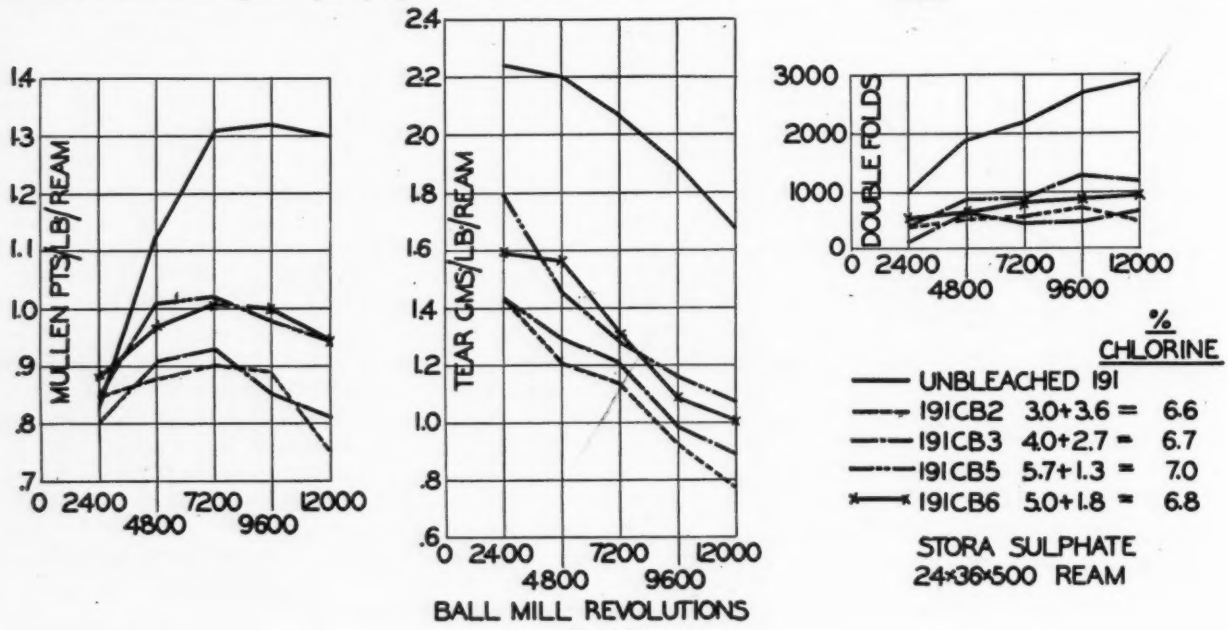


FIG. 8 B

Effect of proportioning available chlorine in the two stages.

TABLE X
KRAFT PULPS BLEACHED BY THE CHLORINE-HYPOCHLORITE PROCESS

Chlorination stage: Period to alkali 5 minutes. Alkali added to pH>8. Temperature 20-25 deg. C. Consistency 3 per cent.
Hypochlorite stage: Temperature 30-35 deg. C. Consistency 3 per cent.

Type of pulp	Chlorination stage: Chlorine Added per cent	Chlorination stage: Chlorine Consumed In acid stage per cent	Chlorination stage: Chlorine Consumed Total per cent	Chlorination stage: Period to Exhaustion minutes	Hypochlorite stage: Chlorine Added per cent	Hypochlorite stage: Chlorine Consumed per cent	Hypochlorite stage: Period of bleaching minutes	Both stages: Chlorine Added per cent	Both stages: Chlorine Consumed per cent	Chemical properties: Alpha cellulose per cent	Chemical properties: Insoluble in 7.14% NaOH per cent	Chemical properties: Copper number	Ives luminosity (calculated): White	Ives luminosity (calculated): Yellow	Ives luminosity (calculated): Red	Ives luminosity (calculated): Black
Northern Pine																
Unbleached ..	...	...	...	...	...	...	...	...	...	92.4	89.9	1.7	...	...	...	...
Bleached	8.5	6.5	8.5	25	1.5	1.5	290	10.0	10.0	92.0	82.5	2.3	75.2	5.4	3.2	16.2
Southern Pine																
Unbleached ..	...	...	...	...	...	...	...	...	...	92.9	89.8	1.7	...	...	...	...
Bleached	8.0	6.1	8.0	47	1.0	1.0	270	9.0	9.0	88.7	81.7	1.5	75.0	7.1	2.9	17.0
Gutzeit																
Unbleached ..	...	...	...	...	...	...	...	...	...	93.4	88.9	1.0	...	...	...	...
Bleached	7.0	4.8	6.9	60	1.2	1.0	360	8.2	7.9	87.5	76.0	2.0	80.8	6.9	0.9	11.4
Goat																
Unbleached ..	...	...	...	...	...	...	...	...	...	90.5	88.3	1.8	...	...	...	...
Bleached	11.0	7.4	11.0	225	1.8	1.6	360	12.8	12.6	86.0	71.3	2.2	78.3	4.6	3.2	13.9
Western Hemlock																
Unbleached ..	...	...	...	...	...	...	...	...	...	94.6	90.5	1.8	...	...	...	...
Bleached	8.0	5.4	8.0	100	1.2	1.2	390	9.2	9.2	92.4	79.8	2.2	80.0	2.7	1.9	15.4

pulp are to be met. The period should not in any case, however, exceed 20 minutes.

The alkali, which may be a solution of caustic or a milk of lime, is injected continuously into the pulp just after the latter has left the reaction tower. Mixing of the alkali with the pulp is effected in the same manner and by the same facilities as those used for mixing chlorine and pulp. Only after the pulp has been made distinctly alkaline is it discharged from the chlorinator.

The alkaline pulp, now containing some available chlorine in the form of hypochlorite is discharged to any type of equipment that will provide a period of about one hour of relatively quiet retention of the pulp during exhaustion of the residual available chlorine. The pulp, for this purpose, may be discharged into one of two mildly agitated chests which are filled and emptied alternately; or it may be allowed to flow continuously in a horizontal channel provided with mild agitation or, still better, it may be passed upward through a tower without agitation. In the last case, provision is usually necessary for a pump to force the stock in the tower to a height higher than the outlet from the chlorinator. The height of the tower is determined with reference to the requisite retention period and also to a discharge elevation that will permit gravity flow to the washer and then to the hypochlorite bleachers.

Regulating the Flow of Pulp

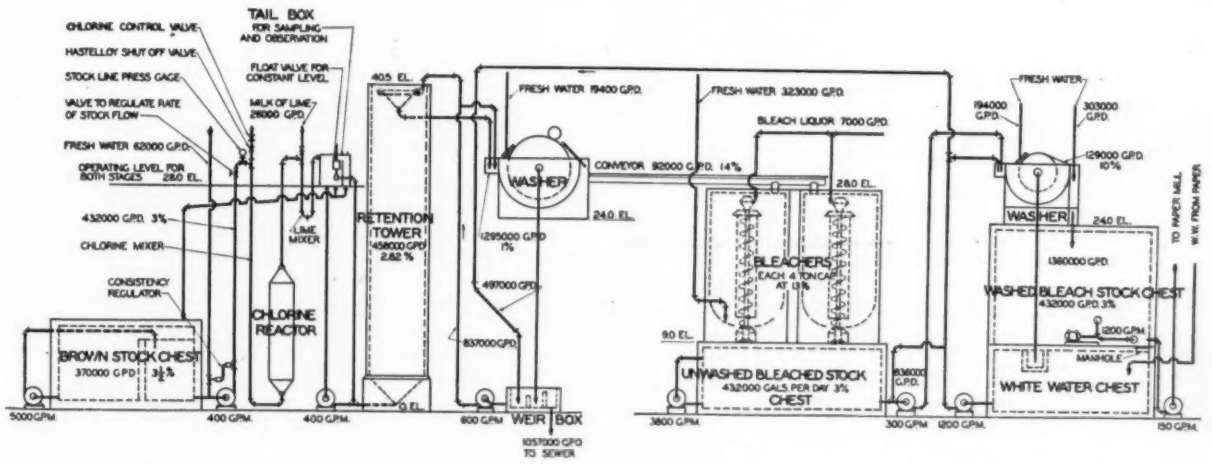
It is evident from what has already been said that for the most desirable results the rate of fiber flow through the chlorinator should be uniform unless intentionally changed by the operator. Uniformity of rate of fiber flow can be obtained by securing uniformity of consistency and of volume rate of flow.

The pulp consistency can be regulated to the necessary degree of accuracy either to or from the brown stock chest by means of any of the several regulators found satisfactory in commercial operation.

The volume rate of flow can be held substantially uniform if the inlet and discharge heads of the pumps are held uniform. A uniform inlet head can be maintained by the selection of a suitable type of circulation agitation in the brown stock chest and the installation of a well with overflow. The discharge head is determined by the resistance through the chlorinator and will be uniform for a given stock so long as, and to the degree that the consistency is uniform. A valve in the stock line serves to adjust the total resistance of the chlorinator so as to establish the head necessary for the desired rate of flow.

Regulating the Flow of Chlorine

Undoubtedly there have already arisen in your minds questions as to how the chlorine is proportioned to the



PATENTS APPLIED FOR ON CHLORINE PROCESS & EQUIPMENT

FIG. 10

Flow diagram of chlorination bleaching process. The process as shown is for a daily capacity of 60 tons of kraft pulp bleached by one chlorination stage followed by one hypochlorite high density stage. Other types of consistency regulators, washers and bleachers may be used as desired. The vertical dimensions are approximately to scale.

pulp and as to how variation in the chlorine demand of the pulp are determined. The answers which we have found to questions such as these are, we believe, vital to the successful operation of the process.

In the first place the process itself is so operated that it can be made automatically and continually to serve as a test for chlorine demand. Correct operation for any given grade of pulp results in a uniform concentration of residual available chlorine at the end of the acid period, i. e. just prior to the addition of alkali. With pulp and chlorine flowing at uniform rates the residual available chlorine will decrease as the hardness of the pulp, or its chlorine demand, increases. Conversely the residual chlorine will increase as the hardness of the pulp decreases. Variation in chlorine demand can be taken care of by varying the chlorine flow so as to maintain a uniform concentration of residual chlorine. In the ordinary operation of a pulp mill in which suitable provision has been made for blending the stock in a reasonably large brown stock chest, the variations occur gradually and the amplitude of the fluctuations is not great. Occasional tests of the chlorinated stock are sufficient to serve as a guide to the adjustment of the chlorine flow. Even where very large and unexpected changes occur in chlorine demand and full adjustment of the chlorine flow has not been secured, the effect on the final bleached product is relatively small and there is ample opportunity to correct the oversight by suitable proportioning of the bleach and pulp in the second stage.

Practicable means have been developed for the control of the chlorine which is injected in either gas or liquid phase. A simple metering device is now in practical operation which both indicates and records the rate of flow of gaseous chlorine. With the aid of these facilities it is easy to adjust intelligently the chlorine flow as called for by the results of the occasional tests for residual chlorine.

The magnitude of the residual chlorine content to which the flow of chlorine is adjusted is determined empirically for each mill. That value is selected, which results in a washed chlorinated product having the bleachability predetermined as best suited to the quality of product desired in that mill.

Regulating the Addition of Alkali

The flow of alkali is regulated so that the stock emerging from the chlorinator has a pH greater than 8. This can readily be determined with a satisfactory degree of accuracy by qualitative tests with phenolphthalein. Incidentally the stock itself is a practical color indicator for the proportioning of both chlorine and alkali; the color of the acid stock for chlorine and of the alkaline stock for alkali.

Regulating the Pulp Output

The rate of output from a chlorinating unit can be decreased at will by decreasing the consistency which decreases the rate of fiber flow without appreciable change in the period of chlorination. Still further reduction in output can be made by decreasing the volume rate of flow. These changes will involve a change in the standard set for the concentration of residual chlorine but the change can be made intelligently at the time the rate of output is adjusted.

Chlorination Equipment.

Probably the most vital features in the chlorination equipment are the materials of construction. The chemical engineering field has been carefully surveyed in an endeavor to select materials which are dependably resistant to the corrosive action of mixtures of dilute hydrochloric acid and chlorine, and of these alternating with dilute alkalies. The last is an especially difficult specification to meet. The materials must, of course, be reasonable in cost.

None of the equipment normally used in the pulp and paper industry is made of materials which fully meet the specifications. Concrete is rapidly eroded by the acid and chlorine. Tile as used for lining bleaching equipment are satisfactory but the mortar normally used to set them up has not been resistant to the alternate action of acid and alkali. Practically all of the metals used in normal pulp mill equipment construction fail to resist combinations of these chemicals. Wood gradually reacts with the chlorine and becomes soft and spongy.

These facts make it sufficiently evident that it is impracticable, except possibly for short experimental periods, to chlorinate pulp in equipment normally available in a pulp mill. Even then the product is likely to become contaminated with sand and grit from concrete or mortar, with slivers from wood or with metal salts which may stain the pulp and catalyse its chemical disintegration.

Experience over ten years with rubber lined tank cars for handling acids supplemented by somewhat more limited experience with equipment lined with special composition rubber for resistance to chlorine, has led to the adoption of rubber lined steel equipment for all parts of the chlorinator equipment that are exposed to acid and chlorine or to their action alternating with an alkali. Over a year's experience with this equipment has revealed no failure fully to withstand the demands made upon it.

The injectors for chlorine and lime and their cut off valves are made of Sastelloy C, a metal which has proven satisfactorily resistant to the wet chemicals. Owing to the relatively small size of the equipment used for the acid stage of chlorination, a size made small by virtue of the short period used for chlorination, the equipment can be constructed of these corrosion resistant materials at a very reasonable overall cost.

The Bleaching Process as a Whole

No attempt will be made to discuss in detail at this time phases of the complete bleaching process other than those relating to chlorination. Attention is directed, however, to Fig. 10 which is a flow diagram showing a layout consisting of a chlorination and a hypochlorite stage with washing after each. The diagram is merely suggestive. Consistency regulators, washers and bleachers may be modified as desired. Attention is directed to the counterflow principle which is applied to the washing of the pulp. This effects satisfactory washing with a minimum of water and concentrates the effluent to the sewer at one point.

Acknowledgment

The authors make grateful acknowledgment of the generous and sustained support given by the officers and engineering staff of the Hooker Electrochemical Company, to the technical and practical development of the chlorination process.

Acknowledgment is also made of the courtesy of Bulkley-Dunton & Co. and of Stevens & Thompson Paper Company who supplied the imported pulps used in these investigations.

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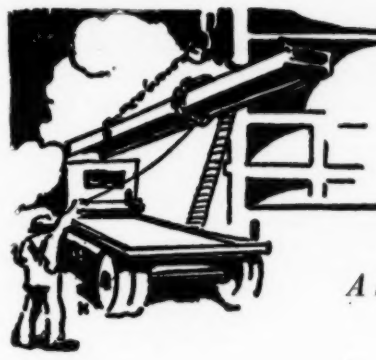


CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Pulaski, Va.—The B. Engel Paper Box Company, 123 Sussex avenue, Newark, N. J., manufacturer of paper boxes and containers, has leased property at Pulaski, known as the Keister Building, and will improve and equip for a new branch plant. It is proposed to provide facilities for employment of about 25 workers. Plant is scheduled to be ready for operations by close of year. It is understood that company will continue manufacture at Newark, as heretofore.

Chicago, Ill.—The Shellmar Products Company, 3501 West 48th place, glassine and other paper products, including printed paper goods, has asked bids on general contract for a one-story top addition to paper and printing plant at 4822-30 South St. Louis avenue, to be 108 x 205 feet. Work is estimated to cost about $100,000, with equipment, and will be placed in progress at early date. A. Epstein, 2001 West Pershing Road, Chicago, is architect and engineer, in charge.

Newton Falls, N. Y.—Plans for new addition to mill of the Newton Falls Paper Company, referred to in these columns last week, will be drawn under direction of T. C. Hanna at company headquarters, 330 West Forty-second street, New York, and are expected to be completed at early date. Initial work is reported to cost approximately $50,000, instead of larger amount, previously noted.

Lockland, Ohio—Fire recently damaged a portion of plant of the Richardson Paper Company, Cooper avenue. An official estimate of loss has not been announced, but is reported as slight.

St. Paul, Minn.—The Minnesota Mining and Manufacturing Company, 791 Forest street, has taken bids on general contract for new additions to sandpaper and abrasive paper stock manufacturing plant, comprising two top story extensions to present mills Nos. 2 and 3. It is expected to place award and begin superstructure at early date. Structures will be 46 x 152 feet, each, and estimated to cost over $40,000, with equipment. Toltz, King & Day, Inc., Builders' Exchange Building, St. Paul, is architect and engineer.

Los Angeles, Calif.—The Independent Paper Box Company has been organized with a capital of 300 shares of stock, no par value, to take over and expand company of same name, with plant at 2420 McPherson street, manufacturer of paper boxes and containers. Incorporators of new company include Roy E. Mulljns, Joseph F. Kelch and Joseph C. McCormick.

Chagrin Falls, Ohio—The Adams Bag Company, Cleveland and Mill streets, manufacturer of manila and other heavy paper bag and containers, has awarded a number of miscellaneous sub-contracts for erection of new one-story addition, recently referred to in these columns, and will proceed with foundations and superstructure at once. Contract for excavating, grading, etc., has been let to the Hunt Company, Chagrin Falls. General erection contract will be carried out by the H. K. Ferguson Company, Hanna Building, Cleveland, Ohio. Structure will be 61 x 140 feet, and will be used for storage and distributing service. Two traveling cranes will be installed. Work is reported to cost about $35,000, with equipment.

New York, N. Y.—Majestic Paper and Twine Company, 109 Wooster street, is planning alterations and improvements in building at 721 Broadway, recently leased for company headquarters, storage and distributing service. Work is reported to cost over $20,000. Company plans early occupancy.

Watervliet, Mich.—The Watervliet Paper Company is running on a six-hour day shift in its coating division, with increased working quota. It is proposed to continue on this basis for some weeks to come.

Akron, Ohio—The Palmer Match Company, Kenmore district, Akron, has completed plans and will soon begin construction of a new addition to plant on Corey avenue, primarily for the manufacture of book matches, including paper-converting department for such purpose. The new structure is reported to cost close to $300,000, with machinery. Hannah & Sterling, Publication Building, Pittsburgh, Pa., are architects. C. G. Allen is superintendent at plant.

Adrian, Mich.—The Simplex Paper Company has recently added to working forces at mills at Adrian and Palmyra, Mich., and is now giving employment to more than 150 persons at the two plants. Present working schedule is expected to be continued for some weeks to come.

Parkersburg, W. Va.—The Viscose Company, Marcus Hook, Pa., manufacturer of cellulose rayon products, is running on a capacity schedule at local mill, as well as at branch plants at Lewistown, Pa., and Marcus Hook, giving employment to full working quotas in different departments.

St. John, N. B.—The Port Royal Pulp and Paper Company is completing improvements and alterations at the local mill of the Union Point Pulp and Paper Company, formerly operated by the Nashwaak Pulp and Paper Company, Ltd., and will have unit in service soon. The improved mill is expected to develop a capacity of about 125 tons of high grade bleach sulphite pulp per month, and will give employment to large working force.

Neenah, Wis.—The Manhattan Rubber Manufacturing Company, Passaic, N. J., a unit of Raybestos-Manhattan, Inc., is establishing a branch plant in building of Hewitt Machine Company, Neenah, to be used for the manufacture of rubber-covered rolls for pulp and paper mills. Arthur Campbell will be branch manager.

Import Committee Reports New Cases for Trial

1. New Cases

New cases appearing for trial on the October docket of the United States Customs Court, originating as a result of the Import Committee's insistence on proper classification of foreign papers, aggregate paper with a value of nearly $200,000. Among the cases are the following.

PRINTING PAPERS

(a) Eleven importations of imitation or machine hand made paper classified for duty as such at 3 cents per pound and 15 per cent, claimed by importer to be dutiable as book paper at ¼ cent per pound and 10 per cent.

(b) Colored printing paper, weighing 60 pounds, 25 x 38, classified for duty as printing paper, claimed to be duty free as standard news print.

TISSUE PAPERS

(c) Four importations of tissue paper classified for duty at 6 cents per pound and 20 per cent, claimed to be dutiable at 5 cents per pound and 15 per cent.

(d) Fourteen importations of napkins and one of table cloths classified for duty at rates higher than claimed by importers.

FANCY PAPERS

(e) Twenty-eight importations of fancy paper were classified for duty at rates higher than those claimed by importers.

(f) Four imports of flock coated paper were classified for duty as such, not as wall paper at far lower rate as claimed by importers.

(g) Three importations of caoutchouc paper for photographic use classified for duty as embossed coated paper, claimed by importer to be dutiable at lower rate as gummed paper.

BRISTOLS, BOARDS, ETC.

(h) Twelve importations of bristol board of various qualities were held for duty at 3 cents per pound and 15 per cent as bristols, not admitted as board at 10 per cent as claimed.

(i) One importation of matrix board classified for duty at 35 per cent as manufactures of paper, claimed to be dutiable at 5 cents per pound and 20 per cent as manufacture of grease proof paper.

(j) One importation of paper plates, classified for duty as manufactures of paper at 35 per cent, claimed to be dutiable as coated paper. Four importations of paper plates classified for duty as manufactures of paper at 35 per cent, claimed to be manufactures of pulp at 25 per cent.

FINE PAPERS

(k) Writing paper in small sheets imported at San Francisco claimed to be dutiable as plain writing paper, classified for duty with 10 per cent additional for decoration.

(l) Fourteen importations of writing paper were classified at New York for duty at rates higher than claimed by importers. Of these two were of boxed stationery, classified as papeteries, three of writing paper in small sheets, classified with 5 per cent additional for their size, and the balance at 10 per cent additional for special finish.

(m) One importation of drawing paper classified for duty at 3 cents per pound and 25 per cent, as surface decorated, claimed by importer to be dutiable at 10 per cent as paper board.

(n) Eight importations of envelopes held for 10 per cent additional duty for special finish or other decoration.

(o) Six importations of laid writing paper classified for duty as decorated writing paper, claimed by importer to be dutiable as plain writing paper at 10 per cent less duty.

MISCELLANEOUS

(p) One importation of bowl paper classified for duty at 30 per cent as paper cut into shapes, claimed to be dutiable at lower rates.

(q) Three importations of coated paper classified as such claimed to be dutiable as greaseproof paper.

(r) Two importations of gummed paper in bobbins, classified for duty at 5 cents per pound and 20 per cent as manufactures of gummed paper, claimed by importer to be dutiable as plain gummed paper.

(s) One importation of paper cut into shape for boxes classified for duty at 30 per cent, claimed by importer to be dutiable as coated paper.

(t) One importation of vegetable parchment classified for duty as such, claimed by importer to be dutiable as paper board at 10 per cent.

2. Decided by Customs Court

Three shipments of Canadian bulky news print were held to have been undervalued.

3. Relieving Unemployment by Buying Abroad

The publicity department of a large house supplying office equipment recently announced that it was doing its share to promote employment by placing an order for several million dollars worth of supplies, of which a large proportion was of paper. An interesting development is that a large shipment of foreign carbon paper was recently imported for this company. Apparently all of the altruism of this company was not devoted to American labor.

4. Paper Plates

The above report shows rather heavy importations of plates. Anything that can be done to relieve this situation is being done, but any suggestions from domestic interests will be appreciated.

To Move Envelope Plant to Dayton

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, October 24, 1932.—Col. Maxwell Howard, head of several paper manufacturing concerns in the Miami Valley, states that the equipment he purchased from the Centralia, Ill., Envelope Company, located in that city, will be removed to Dayton without delay.

The statement followed the report that the Chamber of Commerce of Centralia was making efforts to retain the industry and had offered inducements to Colonel Maxwell to keep the equipment in its present building, or move it to another structure more suitable. The Centralia Company occupied rather imposing quarters in that city.

Colonel Maxwell, however, said that the advantages of being close to the paper mills which supplied much of the paper for the envelope plant, in fact, it might be said virtually all of it, outweighed those presented by the Centralia Chamber of Commerce officials and he believed it would be to the advantage of his concern to locate the plant in Dayton, where the Aetna paper mills, of which he is president, is located and where ample expert workers may be obtained. Because the Government envelope plant also is located in this city.

Besides Dayton the source of the raw supplies is located in Middletown, Franklin and Urbana.

Obituary

William L. Davis, Sr.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., October 22, 1932.—Death from a sudden heart attack on Sunday morning, October 16, brought to a close the career of William L. Davis, Sr., 74 years old, president of the Dells Paper and Pulp Company, Eau Claire, Wis. He was staying at his summer home on Lake Winnebago at Neenah, Wis., at the time. His health had been unusually good until about two weeks before his death, when he complained of feeling ill. His son, William L. Davis, Jr., and wife were at his bedside when the end came.

Mr. Davis and his late brother, D. R. Davis, acquired the Winnebago Paper Company, Neenah, Wis., in 1885 and operated it together until 1894, when the Dells Pulp and Paper Company was organized at Eau Claire. D. R. Davis went there to take charge as president and remained as head of the mill until his death in 1903. W. L. Davis then sold the Winnebago Paper Company mill to the present Bergstrom Paper Company and moved from Neenah to Eau Claire to succeed his brother as president of the Dells mill.

Other business affiliations of Mr. Davis were a directorship in the Union National Bank of Eau Claire, president of the Eau Claire Dells Improvement Company until sold recently to the Northern States Power Company, and president of the Davis Falls Land Company. He was a member of the Chicago Athletic Club and of the Masonic Lodge.

The deceased manufacturer was born at Neenah, Wis., January 22, 1858. Although of later years he resided at Eau Claire, he maintained his home at Neenah and spent his summers there. He was an ardent yachtsman, and sailed crafts of his own for many years in the regattas of the Inland Lake Yachting Association. He also was a hunting enthusiast and at one time possessed a large stable of blooded horses. He was married at Neenah December 14, 1881, to Miss Anna Bowron, of Oshkosh, Wis. Last December the couple celebrated their golden wedding anniversary. His wife died earlier this year. The survivors are two sons, S. R. Davis, vice president of the Dells Paper and Pulp Company, and W. L. Davis, Jr., general superintendent of the mill; also a daughter, Mrs. Eileen Saunenig, St. Petersburg, Fla.

Burial took place at Oak Hill Cemetery, Neenah. The active pallbearers included F. J. Sensenbrenner, John R. Kimberly, Hugh Strange, C. A. Babcock, D. K. Brown and F. E. Ballister. Honorary bearers were Francis McEnery, Chicago; Martin Baker, Eau Claire; James Hart, Menasha, Wis., and William Kellett, Frank Leavens and James Bergstrom, Neenah.

Riley M. Bates

Riley M. Bates, formerly identified with the Bates Valve Bag Company, died at his home in Minneapolis, Minnesota, on October 10, after an extended illness. He was fifty-eight years old.

Mr. Bates was a younger brother of A. M. Bates, the founder of the Bates Valve Bag Company. He was with the company for seventeen years, serving as vice president and director during most of that time. He retired from active duty in 1929 following a heart attack.

Mr. Bates spent the years 1919-20-21 in Europe establishing the extensive foreign operations of the home company. It was during this time that he saw kraft paper bags used as cement containers in Norway, which eventually led to the adoption of the idea and the manufacture of such bags in the United States.

Mr. Bates is survived by his wife, Grace E. Bates, and two sons, R. M. Bates, Jr., and Donald E. Bates.

Chicago Paper Market Irregular

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., October 22, 1932.—Sentiment, which seemed to be mounting slowly upward a week ago, gives evidence of turning downward as Chicago paper representatives report a somewhat puzzling slump following activities of September and the first few days of October. Unsettlement over the immediate outlook, partly political, is regarded as one factor in the present reported dullness. Prices in practically all lines are reported to be at least stationary and this, say the executives interviewed, is at least an encouraging sign.

The kraft market is improved slightly with the prices stiffened after the jolt of a short time ago. Local jobber credits are said to be very slow. The news print market is discussing the recent price changes brought about through reported retaliatory slashes on the part of newsprint mills. Ground woods are reported dull. Books and covers are little changed over the past week. Bonds, ledgers and writings, experiencing a spirited pick-up a month ago, have slid backwards a bit in demand, say reports.

The board market is finding optimism in reports from Eastern markets that show improvement—a betterment which is expected to travel Westward within a short time. Board received quite a bit of publicity last week because its improvement was taken as an indicator for general increase. The waste paper market is dull, Chicago dealers suffering another bump when the Printers Federation decided to employ an agent to sell its waste paper products direct to the mills. Quite a number of Chicago sales representatives are out of the city, perhaps in the belief that business outside Chicago is better.

New Morris Pump Bulletin

A bulletin on centrifugal pumps for pulp and paper mill service has just been published by Morris Machine Works.

A particular useful feature of the bulletin is a two-page reference chart showing flow sheets of a typical ground wood process, soda or sulphate process, sulphite process, and paper mill, with keys to the various applications of suitable Morris Centrifugal Pumps for both process work and general plant services. Besides giving an interesting bird's eye view of typical pulp and paper mill processes, this chart serves as a convenient index for the bulletin which briefly describes Morris Non-Clogging Pumps for handling stocks of all consistencies, Slurry Pumps for clay-bearing liquids, milk of lime, soda ash and other gritty mixtures, Double-Suction and Single-Suction Pumps for white water or clear water, and General Service Pumps.

The illustrations include exterior views, sectional views, typical performance curves, and installation views for each Morris type. Additional useful features of the bulletin are tables of capacities in gallons of horizontal and vertical tanks, suggestions for calculating the friction of paper stock in pipe lines and tables of friction losses of clear water in pipe lines, together with a chart showing the weight of dry air pumped in 24 hours at various capacities and for various consistencies. Much of this special data was made up for this bulletin and is not to be found elsewhere. Copies of the bulletin may be obtained by addressing Morris Machine Works, Baldwinsville, N. Y., asking for Bulletin 148.

Complaint Against Bird & Son Dismissed

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 26, 1932.—The Federal Trade Commission has dismissed the complaint against Bird & Son, Inc., of East Walpole, Mass., manufacturers of paper boards, boxes, roofing materials and floor coverings, charging misrepresentation of one of its paper board products. The complaint was dismissed without prejudice.

In its complaint against Bird & Son the Commission charged in part:

The term "Binders Board" has long been used and known in the book binding, publishing, paper board and other industries to designate and describe a product made from pulp of a base stock of mixed paper into a single-ply homogeneous sheet ranging in thickness as desired from .030 to .300 inches, having an average density of .9 grams per cubic centimeter and an average weight of 56 pounds per cubic foot.

The term "Chip Board" has long been used and known in the box board, paper board and other industries to designate and describe a product made from pulp of a base stock of mixed papers into single-ply sheets or rolls ranging in thickness as desired from .012 to .065 inches, having an average density of .6 grams per cubic centimeter and an average weight of 37 pounds per cubic foot.

When two or more sheets of "Binders Board" have been laminated or pasted together, the resulting product has been known as "Laminated Binders Board" or "Pasted Binders Board." When two or more sheets of "Chip Board" have been laminated or pasted together, the resulting product has been known as "Laminated Chip Board" or "Pasted Chip Board."

"Binders Board" is distinguished from "Chip Board" by its greater bursting, tensile and flexile strength, its greater resistance to moisture and the greater degree of coherence and matting of its fibers. "Binders Board" is made on a machine known and designated in the paper and pulp industry as a wet machine, and requires substantial amounts of hand labor and the application of high pressure to the product while wet and is used primarily in the covers of books. "Chip Board" is made on a machine known and designated in the paper and pulp industry as a multi-cylinder machine, and is entirely machine made and is not subjected to high pressures while wet, and is used primarily in making cardboard boxes.

In the course and conduct of its business the respondent has been and is now soliciting the sale of and selling and transporting in interstate commerce certain paper board products which the respondent designates, describes and labels "Laminated Binders Board." Respondent solicits the sale of and sells its product above referred to as "Laminated Binders Board" to bookbinders and publishers and to other purchasers and prospective purchasers of paper board.

The product of the respondent designated, described and labeled by the respondent as "Laminated Binders Board" is not the product known in the bookbinding, publishing and paper board industry as "Laminated Binders Board" in that it is not composed of "Binders Board" laminated or pasted together, but is in truth and in fact the product known in the bookbinding, publishing and paper board industry as "Laminated Chip Board" or "Pasted Chip Board." The said term "Laminated Binders Board" as used by the respondent is false and misleading and has the capacity and tendency to mislead and deceive many persons in the bookbinding, publishing, and paper board industry into purchasing said product in the belief that it is the product commonly known as "Laminated Binders Board" and that the said product has the characteristics and qualities of the product long known and described as "Binders Board" or "Laminated Binders Board."

The above acts and things done by the respondent are all to the injury of competitors of the respondent manufacturing "Binders Board" and "Laminated Binders Board" and are all to the injury and prejudice of respondent's competitors manufacturing "Chip Board" and "Laminated Chip Board" and are to the injury and prejudice of the public and constitue unfair methods of competition in commerce within the intent and meaning of Section 5 of an Act of Congress entitled "An Act to create a Federal Trade Commission to define its powers and duties, and for other purposes," approved September 26, 1914.

Boston Paper Market Conditions

[FROM OUR REGULAR CORRESPONDENT]

BOSTON Mass., October 24, 1932.—the volume of business in the wholesale paper market here is estimated as about the same, on the average, as for the previous week. The first half of the month was particularly good in some cases. The severe rains last week lessened retail trade considerably, influencing in some quarters the amount of wholesale trade, particularly among wrapping paper dealers. On the other hand, a few report a little increase in the volume of kraft orders. Reports in the fine paper division vary. While some have experienced no improvement, others have found purchasers buying more freely, although orders have been small, with small profits.

The box board situation is practically the same. Merchants and mill representatives are endeavoring to fill as rapidly as possible their orders from the box trade, particularly for candy carton and shoe carton purposes. Quotations remain at the same levels.

In several cases, buyers of paper specialties of high grade, as for engraving purposes, are placing substantial orders for use in various sections of the country. These buyers had been ordering in small lots during previous months of the current year. Some who had placed orders a year ago are now sending specifications.

In most grades of paper stock there is considerably less activity; in some, hardly any, compared with the recent spurt. It is becoming more difficult to sell, but prices are unquotably lower. The Boston trade is hopeful that prices will advance, as they have in New York. A few exceptions to the general inactivity are noted. There is a greater demand for soft shavings, causing a rise from 1.50 to a range of 1.50 @ 1.60. More orders for No. 1 books, heavy, have brought about an advance from a range of .50 @ .60 to .55 @ .65.

The general twine situation has improved materially. Prices of both hard and soft fibres have advanced.

New "Westvaco" Agents Appointed

ATLANTA, Ga., October 24, 1932—The S. P. Richards Paper Company, Atlanta, Ga., have been appointed agents and distributors in the Southeastern territory for the products of the West Virginia Pulp and Paper Company, producers of coated and uncoated book papers, writing, bond, mimeograph, bristols and specialties.

The seventeen mills of the West Virginia company produce over 1,400 tons of pulp and paper daily, and the Richards company, who themselves are the oldest distributing house in the Southeast, are to be congratulated upon making a connection of this high character.

The well known and established "Westvaco" brands will be carried in stock in Atlanta and also in the Richards new branch warehouse, located in Montgomery, Ala.

MEASURE the Snap and Rigidity of your papers with——→

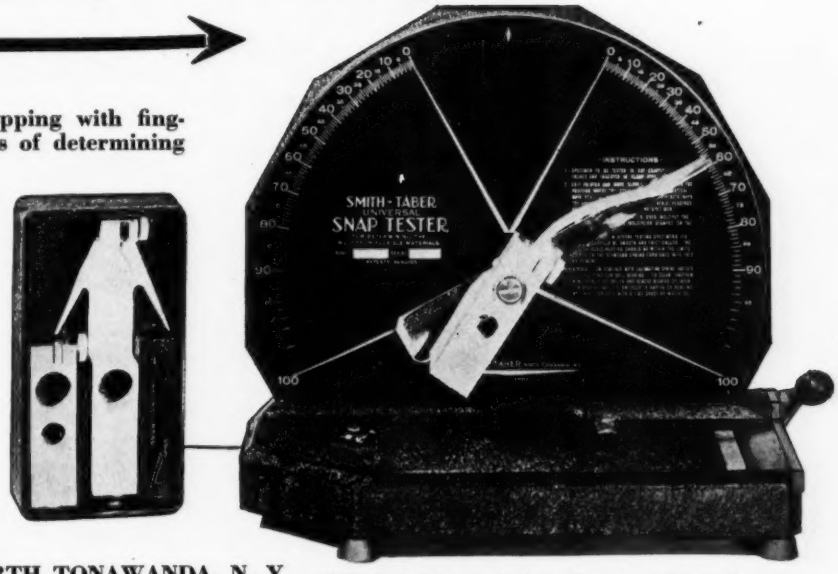
Replaces the "rattle test", "snapping with fingers", and other "guess" methods of determining rigidity and snap.

It accurately determines the rigidity of paper stocks from thin Onionskins to heavy-guage Pressboards.

The exclusive Duo-dial feature permits applying bending stress against both wire and felt sides, thus showing the effects of coatings or non-uniform densities on the stiffness of the sheets.

Includes built-in, precision-test strip cutter with set guages for both length and width.

Write for illustrated circular.



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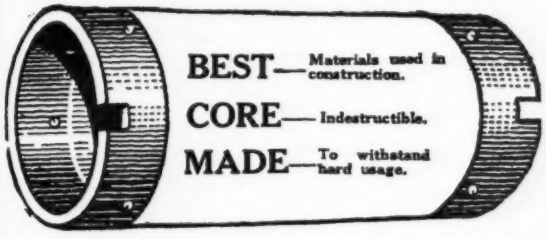

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HAMILTON, ONTARIO

Elixman Paper Core Company
CORINTH, N. Y.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING OCTOBER 22, 1932

CIGARETTE PAPER

M. Speigel & Son, Ingria, Barcelonia, 8 cs.; American Tobacco Co., Amer. Importer, Havre, 100 cs.; Wilkinson Grey & Co., Augustus, Genoa, 10 cs.; American Tobacco Co., Ile de France, Havre, 450 cs.; Champagne Paper Corp., Ile de France, Havre, 50 cs.; Standard Products Corp., Ile de France, Havre, 34 cs.; P. J. Schweitzer, Excambion, Marseilles, 1 cs.; American Tobacco Co., Pr. Harding, Havre, 150 cs.

WALL PAPER

Meadows Wye & Co., Bremen, Bremen, 1 cs.; F. J. Emmerich, New York, Hamburg, 4 bls.; R. F. Downing & Co., New York, Hamburg, 1 cs.; Titan Shipping Co., Pr. Harding, Havre, 2 cs.

NEWS PRINT

Jay Madden Corp., Stuttgart, Bremen, 132 rolls; Perkins Goodwin & Co., Stuttgart, Bremen, 64 rolls; W. H. Bell, Markland, Liverpool, N. S., 3,103 rolls; Parsons & Whittemore, Inc., Fred. VIII, Oslo, 181 rolls; Pulp & Paper Trading Co., Fred. VIII, Oslo, 92 rolls; ——, New York, Hamburg, 84 rolls.

PRINTING PAPER

Keuffel & Esser Co., Amer. Importer, Hamburg, 34 rolls; Intl Forwarding Co., J. Jadot, Antwerp, 12 cs.; E. Dietzgen & Co., Veendam, Rotterdam, 24 cs.; E. Dietzgen & Co., New York, Hamburg, 8 cs.

WRAPPING PAPER

Walker Goulard Plehn Co., Stuttgart, Bremen, 591 rolls; ——, Stuttgart, Bremen, 369 rolls; Van Oppen & Co., Excambion, Genoa, 35 cs.; Sanita Wrap Co., Excambion, Marseilles, 31 cs.

DRAWING PAPER

Keuffel & Esser Co., Amer. Importer, Hamburg, 45 cs., 4 rolls.

FILTER PAPER

H. Reeve Angel & Co. Inc., Amer. Shipper, London, 6 cs.; C. Schleicher & Schull Co. Inc., Pr. Harding, Hamburg, 6 cs.

COLORED PAPER

Beckhard Simfred Co., Stuttgart, Bremen, 6 cs.; F. Murray Hill Co., Pr. Harding, Hamburg, 2 cs.

VENEER PAPER

Bank of Montreal, Kinai Maru, Yokohama, 1 cs.

METAL COATED PAPER

Globe Shipping Co., Bremen, Bremen, 44 cs.; K. Pauli Co., New York, Hamburg, 13 cs.

SURFACE COATED PAPER

Gevaert Co. of America, Westernland, Antwerp, 32 cs.; Globe Shipping Co., New York, Hamburg, 1 cs.

COATED PAPER

Happel & McAvoy, New York, Hamburg, 10 cs.

PARCHMENT PAPER

Fish Schurman Corp., Veendam, Rotterdam, 2 cs.

DECALCOMANIA PAPER

Phoenix Shipping Co., Bremen, Bremen, 1 cs.; American Express Co., Bremen, Bremen, 8 cs.

TRANSFER PAPER

Rohner Gehrig & Co., Bremen, Bremen, 9 cs.

TISSUE PAPER

P. J. Schweitzer, Excambion, Marseilles, 15 cs.

WRITING PAPER

C. Steiner, Stuttgart, Bremen, 3 cs.; Japan Paper Co., American Shipper, London, 4 crates; Beckhard Simfred Co., Ile de France, Havre, 6 cs.

ENVELOPES

Beckhard Simfred Co., Stuttgart, Bremen, 12 cs.

COVER PAPER

Intl Forwarding Co., New York Hamburg, 4 cs.

CARD BOARD

D'Orsay Perfumeries, Ile de France, Havre, 3 cs.; J. Waldron Corp., New York City, Bristol, 8 rolls.

RAW CARD

F. C. Strype, Bremen, Bremen, 20 cs.

IVORY BOARDS

F. C. Strype, Veendam, Rotterdam, 33 cs., 44 rolls.

MISCELLANEOUS PAPER

Corn Exchange Bank, Trust Co., Asuka Maru, Kobe, 15 cs.; Old Town Ribbon & Carbon Co., Ingria, Marseilles, 8 cs.; ——, Bremen, Bremen, 19 cs.; Ingersoll Rand & Co., Sinaia, Constanza, 1 cs.; R. W. Greef & Co. Inc., Stuttgart, Bremen, 2 cs.; Irving Trust Co., Kinai Maru, Osaka, 12 cs.; C. L. Voorhees, Kinai Maru, Yokohama, 10 cs.; R. H. Phibant, J. Jadot, Antwerp, 2 bls.; Phoenix Shipping Co., Ile de France, Havre, 2 cs.; Keller Dorian Paper Co., Ile de France, Havre, 6 cs.; Coawrd, McCann, Inc., Ile de France Havre, 7 cs.; Saentis, Inc., Veendam Rotterdam, 1 cs.; Steiner Paper Corp., Veendam, Rotterdam, 10 cs.; Wedeman Godknecht & Lally, New York, Hamburg, 5 cs.; Atlantic F'd'g Co., New York, Hamburg, 2 bls.; ——, New York, Hamburg, 24 cs.

RAGS, BAGGINGS ETC.

I. Hinerfeld, Schodack, Havre, 6 bls. rags; Amderutra Transport Corp., Amer. Importer, Hamburg, 106 bls. rags; T. D. Downing & Co., Transylvania, Glasgow, 73 bls. bagging; T. D. Downing & Co., Transylvania, Glasgow, 71 bls. rags; E. J. Keller Co. Inc., Fred. VIII, ——, 62 bls. rags, Bank of N. Y. & Trust Co., Lucia C. Trieste, 281 bls. rags; Banco Coml Italiane Trust Co., Lucia C., Trieste, 58 bls. hemp twine; Bank of N. Y. & Trust Co., Habana, Coruna, 44 bls. bagging; E. J. Keller Co. Inc., West

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SUPERCALENDERED and MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Cover and Music Paper, Index Bristol, Post Card and Label Papers

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Bleached Spruce Sulphite Pulp, Soda and Kraft Pulp

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All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY
CANTON, MASS.
Woolen manufacturers since 1856

Eldara, ——, 88 bls. rags; E. Butterworth & Co., Inc., Exilona, Genoa, 83 bls. rags; Castle & Overton, Inc., Exilona, Genoa, 65 bls. rags; A. M. Mallin, Morro Castle, Havana, 17 bls. rags; Amderuta Transport Corp., New York, Hamburg, 14 bls. rags.

GLUE STOCK, ETC.

Victory Shipping Co., Amer. Importer, Hamburg, 7 bls. blue stock; ——, Stuttgart, Bremen, 100 bags hide glue; H. Bierschenk & Co. Inc., Veendam, Rotterdam, 200 bags hide glue; ——, New York, Hamburg, 100 bags hide glue; ——, New York, Hamburg, 400 bags bone glue.

OLD ROPE

W. Steck & Co., Amer. Importer, Hamburg, 50 coils; National City Bank, Transylvania, Glasgow, 70 coils; Banco Coml Italiane Trust Co., Stuttgart, Bremen, 46 coils; Banco Coml Italiane Trust Co., Habana, Pasages, 230 coils; Continental Bank Trust Co. Habana, Coruna, 24 coils; National City Bank, New York City, Bristol, 186 coils; ——, New York City, Bristol, 39 coils.

WOOD PULP

Lagerloef Trading Co., Lagaholm, Rauma, 2,085 bls. sulphite; Lagerloef Trading Co., Lagaholm, Rauma, 780 bls. mechanical pulp; Johaneson Wales & Sparre, Inc., Karpfanger, Obbola, 525 bls. sulphate, 75 tons; Johaneson Wales & Sparre, Inc., Karpfanger, Sundsvall, 500 bls. chemical pulp, 101 tons; Johaneson Wales & Sparre, Inc., Karpfanger, Sundsvall, 1,650 bls. sulphite, 311 tons; Mead Sales Co., Karpfanger, Sundsvall, 250 bls. sulphite, 50 tons; Johaneson Wales & Sparre, Inc., Karpfanger Hernosand, 1,950 bls. sulphite, 325 tons; Bulkley Dunton & Co., Karpfanger, ——, 1,250 bls. wood pulp, 253 tons; Irving Trust Co., Stuttgart, Bremen, 300 bls. wood pulp; Chemical Bank & Trust Co., Fred. VIII, Oslo, 350 bls. wood pulp, 64 tons; E. M. Sergeant & Co., Fred. VIII, Oslo, 300 bls. chemical pulp, 50 tons; Atterbury Bros. Inc., Fred. VIII, Oslo, 600 bls. sulphite, 76 tons; Perkins Goodwin & Co., Fred. VIII, Oslo, 1,500 bls. sulphite, 304 tons; Castle & Overton, Inc., West Eldara, Rotterdam, 140 bls. wood pulp, 28 tons; Castle & Overton, Inc., New York, Hamburg, 420 bls. wood pulp, 84 tons; Gottesman & Co. Inc., Hjelmaren, Sweden, 750 bls. wood pulp; Gottesman & Co., Inc., Hedderheim, Sweden, 4,875 bls. wood pulp.

PULP WOOD

G. S. Kerr Co., Winroth, Shippegan, 1,450 cords; Polarus Shipping Co., Nyhavn, St. Peters, 998 cords; Amderutra Transport Co., Sangstad, Archangel, 3,077 cords; A. P. W. Pulp & Power Co., Vaga, Sheet, Harbor, 7,262 bls., 1,620 tons.

WOOD PULP BOARDS

Lagerloaf Trading Co., Pr. Harding, Hamburg, 31 rolls.

WOOD FLOUR

State Chemical Co., West Eldara, Rotterdam, 700 bags, 42,000 kilos; The Burnet Co., West Eldara, Rotterdam, 500 bags, 25,000 kilos; State Chemical Co., Veendam, Rotterdam, 300 bags.

PORTLAND IMPORTS

WEEK ENDING OCTOBER 22, 1932

——, Lagaholm, Kirkkoniemi, 2,600 bls. sulphite; ——, Lagaholm, Wiborg, 1,700 bls. sulphate; Irving Trust Co., Lagaholm, Wiborg, 2,101 bls. sulphate; Atterbury Bros. Inc., Lagaholm, Kotka, 170 bls. sulphate; Lagerloef Trading Co., Langaholm, Kotka, 1,094 bls. sulphite; Lagerloef Trading Co., Lagaholm, Rauma, 1,520 bls. sulphate; Lagerloef Trading Co., Lagaholm, Rauma, 790 bls. sulphite; Lagerloef Trading Co., Lagaholm, Rauma, 133 bls. mechanical pulp; Gottesman & Co. Inc., Hedderheim, Sweden, 5,100 bls. wood pulp.

NEW LONDON IMPORTS

WEEK ENDING OCTOBER 22, 1932

——, Lagaholm, Wiborg, 2,929 bls. sulphate; ——, Lagaholm, Kotka, 71 bls. sulphite.

BOSTON IMPORTS

WEEK ENDING OCTOBER 22, 1932

Castle & Overton, Inc., Lagaholm, Rauma, 1,620 bls. wood pulp; ——, Lagaholm, Rauma, 640 bls. sulphate ——, Lagaholm Rauma, 936 bls. sulphite; Irving Trust Co. Lagaholm, Rauma, 525 bls. sulphate; Stone & Downer, Lagaholm, Kotka, 39 rolls news print; Lagerloef Trading Co., Lagaholm, Kotka, 368 bls. sulphite; Lagerloef Trading Co., Lagaholm, Kotka, 650 bls. sulphate; Lagerloef Trading Co., Lagaholm, Rauma, 4,291 bls. sulphate; Lagerloef Trading Co., Lagaholm, Rauma, 320 bls. sulphite; G. F. Malcolm Inc., Britannic, Liverpool, 34 cs. tissue paper; T. D. Downing and Co., Francisco, Hull, 60 bls. new cuttings.

PHILADELPHIA IMPORTS

WEEK ENDING OCTOBER 22, 1932

W. J. Jones Co., Schodack, Havre, 3 cs. wall paper; Castle & Overton, Inc., Schodack, Havre, 223 bls. rags; ——, Schodack, Havre, 160 bls. rags; E. J. Keller Co. Inc., Schodack, ——, 193 bls. rags; Darmstadt Scott & Courtney, Schodack, Dunkirk, 153 bls. rags; J. M. Hagy Waste Works, Asuka Maru, Kobe, 25 bls. rags; ——, Examiner, Algiers, 150 bls. rags; Chase National Bank, Kinai Maru, Kobe, 200 bls. rags; Chase National Bank, Kinai Maru, Osaka, 50 bls. rags; ——, Kinai Maru, Nagoya, 43 bls. rags; ——, Motomar, Genoa, 337 bls. glue stock; E. W. Twitchell, Inc., West Eldara, Rotterdam, 81 cs. wrapping paper; E. J. Keller Co. Inc., West Eldara, ——, 183 bls. rags; Chemical Bank Trust Co., West Eldara, Rotterdam, 39 bls. old rope; Moore & Munger, New York City, Bristol, 40 bags china clay; United Clay Mines Corp., New York City, Bristol, 43 tons china clay; Philadelphia Natl Bank, Motomar, Genoa, 1 bl. 6 cs. stereotype paper; Gottesman & Co. Inc., Topeka, Sweden, 600 bls. wood pulp; E. J. Keller Co. Inc., Frankfurt, ——, 60 bls. rags.

BALTIMORE IMPORTS

WEEK ENDING OCTOBER 22, 1932

——, Karpfanger, Hernosand, 600 bls. sulphite, 100 tons; Bulkley Dunton & Co., Karpfanger, ——, 8,725 bls. wood pulp, 1,722 tons; Johaneson Wales & Sparre, Inc., Karpfanger, Sundsvall, 4,245 bls. sulphite, 804 tons; Johaneson Wales & Sparre, Inc., Karpfanger, Sundsvall, 325 bls. chemical pulp, 66 tons; Parsons & Whittemore, Inc., Karpfanger, Sundsvall, 360 bls. mechanical pulp, 60 tons; J. Andersen & Co., Karpfanger, Soderhamn, 1,000 bls. sulphate, 203 tons; S. George, West Eldara, Rotterdam, 111 bls. old rope; Congoleum Nairn Co., West Eldara, Rotterdam, 177 bls. rags; Gottesman & Co. Inc., Hedderheim, Sweden, 2,520 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING OCTOBER 22, 1932

Chase National Bank, West Eldara, Rotterdam, 177 bls. bagging.

WOOD PULP
AGENTS

PRICE & PIERCE, Ltd.,

60 EAST 42nd ST.
NEW YORK

Certified Performance Reports

"Prove" that—

last 3 to 6 times Longer

Why not send for some of these enlightening REPORTS and be "convinced" of the real merit of Asten Asbestos Felts. In addition, we'll gladly send you copies of numerous letters of praise from various other paper mills. . . . After all,—"Users' Opinions" are the most reliable and convincing.

Read this Extract from one Survey:
Asten Asbestos Felts saved $0.2503 per ton. This is a reduction of 43.9% in dryer felt costs,—and is at the rate of $5,431.20 per year on one machine.

ASTEN-HILL MFG. CO.
Scott's Lane (E. Falls) Phila., Pa.

TI MACHINE STEEL
SHELL BURRS

MANUFACTURED IN
STANDARD SIZES SUITED TO
THE PAPER TRADE

We invite your inquiries

OTHER SPECIALTIES

WARREN IMPROVED CALENDER With flexible blades, Universal Adjustment and Control, Patented — DOCTORS

WARREN IMPROVED DOUBLE DRUM— — WINDER

BALL HYDRANT for Stock Circulating Systems — VALVES

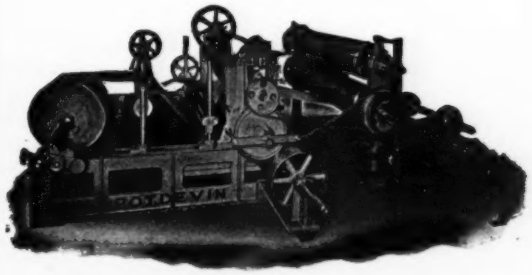
TI MACHINE Semi-Steel Sectional 3-4-5-6-7 Cuts per Inch — BURRS

AND OTHER PAPER MILL MACHINERY

MANUFACTURED BY
TICONDEROGA MACHINE WORKS
TICONDEROGA, N. Y.
SEND FOR BULLETINS—ASK FOR PRICES.

POTDEVIN
PAPER WAXING MACHINERY

Three Widths—52" - 64" - 80"
LIGHT OR HEAVY COATING
WET OR DRY WAX
ONE OR BOTH SIDES



POTDEVIN MACHINE CO.
1223 38th Street, Dept. 4, Brooklyn, N. Y., U. S. A.
Phones: Windsor 1700, 1701, 1702

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, October 26, 1932.

Trading in the local paper market was more lively during the past week. Demand for the various standard grades of paper is gradually expanding. Sales forces of the leading paper organizations are more optimistic than for some tine past. The price situation, however, continues irregular.

Production of news print paper is being maintained in sufficient volume to take care of current requirements. The price situation continues weak and reports of shading are frequent. Archibald R. Graustein, president of the International Paper Company, however, states that his organization has made no concessions of any kind since the new prices were announced on September 21.

Conditions in the paper board market are fairly satisfactory. Demand for box board is improving and the recently advanced prices are well maintained. The fine paper market is more buoyant and tissues are moving freely. Business in the coarse paper market is slightly better and wrapping paper is going forward in good volume.

Mechanical Pulp

The position of the ground wood market is practically unchanged. While demand for both imported and domestic mechanical pulp is light, offerings are not excessive and the industry is in a fairly sound statistical position. Prices are generally holding to previously quoted levels, without difficulty.

Chemical Pulp

Demand for the various grades of domestic and foreign chemical pulp is fairly persistent. Contract shipments are moving at a satisfactory pace. Prices are holding to schedule, in most instances. Imported bleached sulphite is still quoted at from $1.90 to $2.25, on dock, Atlantic ports. Domestic bleached sulphite is offered at from $1.75 to $3.75, f.o.b. pulp mill.

Old Rope and Bagging

The old rope market continues listless. Paper mill demand for both domestic and imported old manila rope is restricted. Small mixed rope is dull. Steadiness prevails in the bagging market. Gunny bagging and scrap bagging are going forward in satisfactory volume. Roofing bagging is practically unchanged.

Rags

While the domestic rag market is somewhat irregular, demand for the various grades of cotton cuttings is fairly active. No. 1 white shirt cuttings continue steady, with offerings limited. The roofing grades are moving with some semblance of regularity. No radical price changes have been reported. The imported rag market continues quiet.

Waste Paper

Board mill demand for the lower grades of paper stock is well maintained. Prices are decidedly firmer. Strictly overissue news is now quoted at from .45 to .50, while strictly folded news is selling at from .40 to .45. The better grades of waste paper are also holding up well. No. 1 soft white shavings have advanced to from $1.40 to $1.50.

Twine

Some improvement was noticed in the local twine market during the past week. Demand for the various grades is better and the outlook for the future is more encouraging than for some time past. An advance of half a cent per pound has been announced on all grades of soft fiber twine.

VERTICAL STACK DRIERS

(Continued from page 48)

(H) Air can be led to any desired point via the hollow sections of vertical stacks making possible a most efficient ventilation at least expense.

(I) If necessary to increase space in machine room for additional driers, it is cheaper to raise the roof than to lengthen building, reset calenders, finishing equipment, etc.

(J) It is possible to change to vertical driers with less time lost to machine operation.

(K) The vertical stack offers the most effective addition to drying capacity.

(L) Felt costs are an appreciable factor in manufacturing cost of paper.

Paper Mill Employment Gains

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 26, 1932.—The September employment index number in the paper and pulp industries was 74.1, compared with 72.2 for August and 79.5 for September of last year, taking 1926 at 100 according to the Bureau of Labor Statistics, Department of Labor. September pay roll index was 49.4 compared with 46.7 for the month of August and 64.2 for the month of September of last year.

The paper box employment index number for September was 69.8 compared with 66.6 for August and 83.1 for September of last year while the payroll index for September was 59 compared with 52.8 for August and 77.7 for September of last year.

Bids for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 26, 1932.—The Government Printing Office has received the following paper bids for 3,000 sheets of gray photo mount board; E. H. Walker Supply Company, at $52.50 per thousand; Barton, Duer & Koch Paper Company, $51.50; Dobler & Mudge, $49.90; Reese & Reese, Inc., $49.50; Charles G. Stott & Co. Inc., $69.50 and $67.50; Old Dominion Paper Company, $48.24; R. P. Andrews Paper Company, $48.00; Stanford Paper Company, $53.53; and George F. Muth & Co., $48.00.

Glens Falls Machine Works

GLENS FALLS, N. Y.

Manufacturers of

IMPROVED ROGERS AND SPECIAL WET MACHINES

STANDARD WET MACHINES

GLENS FALLS ROLLING ACTION FLAT SCREEN

THE A. D. WOOD SAVEALL, THICKENER, WASHER AND WATER SCREEN

GLENS FALLS DECKER AND DECKER WASHER

GLENS FALLS ROTARY SULPHUR BURNER

PULP GRINDERS, THREE OR FOUR POCKET (Roller Bearings)

Ask us about the OLIVER-ROGERS WET MACHINE

RAY SMYTHE, 301 PARK BLDG., PORTLAND, ORE.
Western Representative

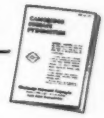
Two Models
for taking temperatures of Drying Rolls

No need to stop the machine when taking roll temperatures. The thermocouple strip of the Cambridge Surface Pyrometer conforms to the shape of the roller. Within five seconds a steady reading of temperature is obtained. The HAND MODEL is a self-contained instrument for use upon readily accessible moving rolls. The EXTENSION MODEL is used for those hard-to-reach surfaces. Both models are sturdy and accurate.

CAMBRIDGE INSTRUMENT CO INC

3732 Grand Central Terminal, New York City

SURFACE PYROMETERS



Send for details of these instruments. They will help you to save money and make better paper.

Chemipulp Process:

FOREMOST IN SERVING CHEMICAL PULP MILLS

TO — Improve efficiency.
— Reduce costs.

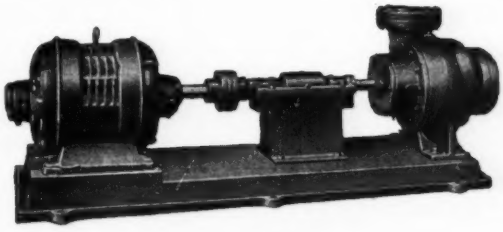
BY — Modern scientific methods.
— Wide operating experience.

Hot SO_2 Liquor & Gas Recovery—eliminates expensive cooling equipment — recovers heat — saves steam — eliminates acid dilution from steam condensation — reduces boiler load peak — strengthens acid — accelerates penetration — cuts sulphur — increases yield and capacity — has been termed, "the all around fixer" for SULPHITE making.

Broadly Covered by U. S. and Canadian Patents

CHEMIPULP PROCESS, INC.
330 Woolworth Bldg., Watertown, N. Y.
1017 White Bldg., Seattle, Wash.

in Canada
319 Castle Bldg., Montreal, Que.



Digester Circulating Pumps

Temperatures up to 450°F—Pressures at 150 to 200 pounds per square inch—Highly corrosive liquors—all of these conditions *demand* a departure from mere conventional design in pumping machinery. A single deep, oversize stuffing box, water jacketed to increase the life of the packing and reduce leakage to a minimum. Extra heavy casing of Nickel-Chrome-Steel Cast Iron alloy developed especially for this service. Ready accessibility—split packing gland —extra heavy flange unions.

These are a few of the features which, combined, mean twenty-four hour duty year after year—efficient—dependable, at nominal first cost.

Send for bulletin 43-A giving full description and specifications.

J. C. STINE CO., TYRONE, PA.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, October 26, 1932.

BLANC FIXE.—The blanc fixe market is moderately active. Prices are holding to previously quoted levels. The pulp is offered at from $42.50 to $45.00 per ton, in bulk; while the powder is selling at from 3½ cents to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—Conditions in the bleaching powder market are fairly satisfactory, although the prevailing demand is mainly routine. Prices are generally holding to schedule. Bleaching powder is quoted at from $1.75 to $2.00 per 100 pounds, in drums, at works.

CASEIN.—The casein market is slightly firmer. Domestic standard ground is now quoted at 7 cents and finely ground at 8 cents per pound. Argentine standard ground is selling at 8 cents and finely ground at 8½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Demand for caustic soda is persistent. The contract movement is regular. Prices are steady. Solid caustic soda is quoted at from $2.50 to $2.55; while the flake and the ground are selling at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY.—The position of the china clay market is somewhat involved, due to the fluctuation of foreign exchange. Foreign china clay is quoted at from $10 to $15 per ton, ship side; while domestic paper making clay is selling at from $5 to $12 per ton, at mine.

CHLORINE.—Steadiness prevails in the chlorine market. Shipments against contract are moving in fairly heavy volume. Prices are holding to the recently revised schedule. Chlorine is quoted at $1.55 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is little changed. The grades of gum rosin used in the paper mills are now quoted at from $3.80 to $4.00 per 280 pounds, in barrels, at works; while wood rosin is selling at $2.80 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—Paper mill demand for salt cake is fairly active. Prices remain unchanged. Salt cake is quoted at from $15 to $16; chrome salt cake at from $12 to $13 per ton, in bulk, at works; while imported salt cake is selling at from $14 to $15 per ton, ship side.

SODA ASH.—The soda ash market is exhibiting a fairly strong undertone. Demand is seasonal and prices remain unaltered. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.00; in bags, $1.25; and in barrels, $1.38.

STARCH.—The starch market is practically marking time. Supplies are moving into consumption in good volume for the time of year. Special paper making starch is quoted at $2.44 per 100 pounds, in bags; and at $2.71 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Business in the sulphate of alumina market is showing signs of improvement. Prices are firm. Commercial grades are quoted at from $1.25 to $1.40; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market continues steady. Sulphur is quoted at $18 per long ton, on orders, of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Trading in the talc market is fairly brisk. The contract movement is average. Prices are holding to schedule. Domestic talc is quoted at from $16 to $18 per ton, in bulk, at mine; while imported talc is selling at from $18 to $22 per ton, in bags, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@38.00
Bonds	4.50	@53.25
Index	6.00	@12.00
Writings—		
Extra Superfine	6.50	@15.00
Superfine	6.25	@14.75
Tub sized	4.50	@ 7.00
Engine sized	4.00	@ 5.00
Book, Cased—		
S. & S. C.	5.25	@ —
M. F.	3.75	@ 5.00
Coated and Enamel	6.25	@ 9.75
Lithograph	6.75	@11.25
Tissues—Per Ream—		
White No. 1	.50	@ .70
Anti-Tarnish M. G. only	.65	@ .70
Colored	.70	@ .90
White No. 2	.55	@ .60
Kraft	.65	@ .70
Manila	.55	@ .60
Manila—		
No. 1 Jute	9.00	@ 9.25
No. 2 Jute	7.75	@ 8.50
No. 1 Wood	4.00	@ 5.25
No. 2 Wood	3.50	@ 4.00
Butchers	3.37½	@ —
Fibre Papers—		
No. 1 Fibre	4.25	@ 5.50
No. 2 Fibre	4.00	@ 4.75
Common Bogus	1.50	@ 3.00
Screenings	2.00	@ 3.00
Card Middies	4.00	@ 5.00
Glassine—		
Bleached, basis 25 lbs., No. 1	.09¼	@ —
No. 2	.11¼	@ —
Bleached, basis 20 lbs.	.11¼	@ —

(Delivered New York)

News, per ton—		
Roll, contract	45.00	@ —
Rolls, spot	45.00	@ —
Sheets	50.00	@ —
Side Runs	30.00	@35.00
Kraft—		
No. 1 Domestic	4.75	@ 6.00
No. 2 Domestic	2.75	@ 3.00
Southern	2.62½	@ 2.75
Imported	2.75	@ 3.50
Boards—per ton—		
News	30.00	@ —
Straw	32.00	@ —
Chip	27.50	@ —
Binders' Boards	62.00	@70.00
Kraft Liner	37.50	@ —
Standard 85 Test Liner	26.50	@ —
Sgl. Mla. Ll. Chip	37.50	@ —

(F. o. b. Mill)

Wood Pulp Boards	70.00	@80.00

Mechanical Pulp

(On Dock)

No. 1 Imported—		
Moist	17.00	@20.00
Dry	17.00	@20.00

(F. o. b. Mill)

No. 1 Domestic	16.00	@24.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	1.90	@ 2.25
Easy Bleaching	1.60	@ 1.75
No. 1 strong unbleached	1.40	@ 1.60
Mitscherlich unbleached	1.55	@ 1.75
No. 2 strong unbleached	1.25	@ 1.35
No. 1 Kraft	1.40	@ 1.65
No. 2 Kraft	1.30	@ 1.40
Sulphate—		
Bleached	1.85	@ 2.15

(F. o. b. Pulp Mill)

Sulphite (Domestic and Canadian)—		
Bleached	1.75	@ 3.75
Easy Bleaching	1.75	@ 1.90
News	1.50	@ 1.65
Mitscherlich	2.25	@ 2.55
Kraft (Domestic)	1.50	@ 2.75

(Delivered Paper Mills)

Soda Bleached	2.25	@ —

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1	4.00	@ 4.25
New White, No. 2	3.00	@ 3.25
Silesias No. 1	3.75	@ 4.00
New Unbleached	5.50	@ 6.00
New Soft Blacks	2.75	@ 3.00
Blue Overall	3.00	@ 3.50
Fancy	1.50	@ 1.75
Washables	1.15	@ 1.40
Mixed Khaki Cuttings	2.50	@ 3.00
Pink Corset Cuttings	2.75	@ 3.25
O. D. Khaki Cuttings	3.00	@ 3.25
Men's Corduroy	1.00	@ 1.25
New Mixed Blacks	2.25	@ 2.50

Old Rags

White, No. 1—		
Repacked	3.00	@ 3.50
Miscellaneous	2.00	@ 2.25
White, No. 2—		
Repacked	1.75	@ 2.00
Miscellaneous	1.50	@ 1.75
Thirds and Blues—		
Repacked	1.50	@ 1.75
Miscellaneous	1.00	@ 1.25
Black Stockings	2.00	@ 2.25
Roofing Rags—		
No. 1	.53	@ .58
No. 2	.48	@ .53
No. 3	.43	@ .48
No. 4	.38	@ .43
No. 5A	.33	@ .38

Foreign Rags

New Rags

New Dark Cuttings	1.40	@ 1.50
New Mixed Cuttings	1.60	@ 1.75
New Light Silesias	3.00	@ 3.25
Light Flannelettes	2.50	@ 2.75
Unbleached Cuttings	4.75	@ 5.25
New White Cuttings	4.00	@ 4.25
New Light Oxfords	3.00	@ 3.25
New Light Prints	1.85	@ 2.25

Old Rags

No. 1 White Linens	5.25	@ 5.50
No. 2 White Linens	4.50	@ 4.75
No. 3 White Linens	3.25	@ 3.75
No. 4 White Linens	1.75	@ 2.25
No. 1 White Cotton	3.50	@ 3.75
No. 2 White Cotton	2.75	@ 3.25
No. 3 White Cotton	2.25	@ 2.50
No. 4 White Cotton	1.40	@ 1.50
Extra Light Prints	1.80	@ 2.00
Ord. Light Prints	1.60	@ 1.75
Med. Light Prints	1.40	@ 1.55
Dutch Blue Cottons	1.35	@ 1.40
French Blue Linens	1.80	@ 1.90
German Blue Linens	1.70	@ 1.80
German Blue Cottons	1.20	@ 1.25
Checks and Blues	1.25	@ 1.30
Lindsay Garments	.75	@ .80
Dark Cottons	.70	@ .75
Old Shopperies	.55	@ .60
New Shopperies	.60	@ .65
French Blues	1.25	@ 1.30

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

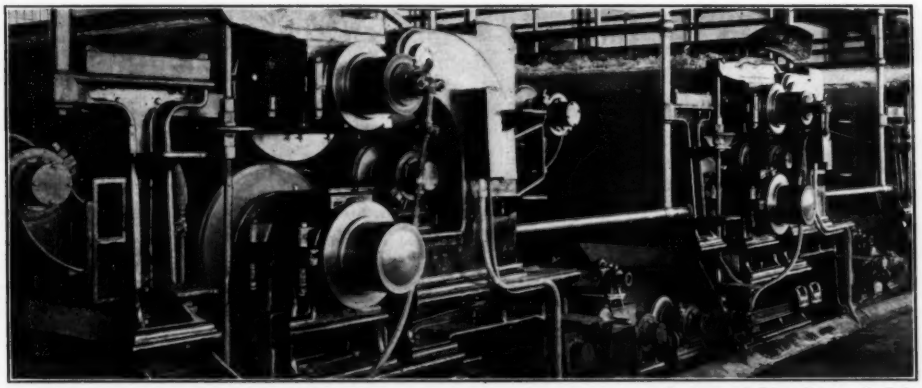
Gunny No. 1—		
Foreign	1.00	@ 1.10
Domestic	1.15	@ 1.25
Wool Tares, light	.80	@ .85
Wool Tares, heavy	.80	@ .85
Bright Bagging	.75	@ .80
Small Mixed Rope	.80	@ .90
Manila Rope—		
Foreign	1.45	@ 1.50
Domestic	1.50	@ 1.75
New Burlap Cut	1.65	@ 1.75
Hessian Jute Threads—		
Foreign	2.60	@ 2.75
Domestic	2.80	@ 3.00

Old Waste Papers

(F. o. b. New York)

Shavings—		
White Envelope Cuttings	1.60	@ 1.70
Ordinary Hard White No. 1	1.50	@ 1.60
Hard White No. 2	1.30	@ 1.40
Soft White No. 1	1.40	@ 1.50
Flat Stock—		
Stitchless	.55	@ .65
Overissue Mag	.55	@ .65
Solid Flat Book	.50	@ .55
Crumpled No. 1	.35	@ .40
Solid Book Ledger	1.50	@ 1.75
Ledger Stock	.45	@ .55
New B. B. Chips	.20	@ .25
Manilas—		
New Env. Cut	1.25	@ 1.35
New Cuttings	1.00	@ 1.05
Extra No. 1 old	.80	@ .90
Print	.35	@ .40
Bogus Wrapper	.30	@ .35
Container	.25	@ .30
Old Kraft Machine—		
Compressed bales	.75	@ .85
News—		
No. 1 White News	1.05	@ 1.15
Strictly Overissue	.45	@ .50
Strictly Folded	.40	@ .45
No. 1 Mixed Paper	.15	@ .20

WHITE STAR RUBBER ROLLS



Courtesy of Rice, Barton & Fales

Running 7 Years— Good for 7 More!

THESE 210" White Star Rolls, a battery of 3 press and one smoothing roll, have been running continuously since 1925. So seldom has there been need of regrinding that no spare was required.

How will you figure the profits in dollars and cents of this splendid investment?

It's far easier to picture the satisfaction of the owners of these White Star Rolls.

But mark this—the White Star Rolls of today are far superior to the above rolls.

Good roll records depend also on good machine conditions—

So consult your machine builder

STOWE-WOODWARD, Inc.

Newton Upper Falls, Mass.

Twines

(F. o. b. Mill)

Cotton—			
B. C., 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finisned Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.15½	@	.16½
No. 2	.11¾	@	.12¾
Tube Rope—			
4-ply and larger	.10¼	@	.10¾
Fine Tube Rope—			
4-ply	.12¼	@	.12¾
3-ply	.13¼	@	.13¾
2-ply	.14¼	@	.14¾
Paper Makers Twine Balls	.09¼	@	.11¼
Box Twine, 2-3 ply	.11¼	@	.12¼
Jute Rope	.09	@	.10
White Hemp	.12¼	@	.12¾
Java Sisal—			
No. 1 Basis	.10	@	—
No. 2 Basis	.09	@	—
New Zealand Sisal	.10	@	—
Sisal Lath Yarn—			
No. 1	.12	@	.14
No. 2	.10	@	.12
Manila Twine	.23	@	.28

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.04	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.07	@	.18
No. 1 M. F. Book	.06½	@	.07½
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated 'I Label	.07½	@	.10
No. 1 Manila	.04¾	@	.05¾
No. 1 Fibre	.04¾	@	.05¾
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¾	@	.03¾
No. 1 Kraft	3.50	@	4.50
Southern Kraft	2.62½	@	—
No. 2 Kraft	2.62½	@	—
Wood Tag Boards	.04¾	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.07	@	.07¾
White Tissue	.07¼	@	.07½

(Delivered Central Territory)

News, per ton—			
Rolls, contract	45.00	@	—
Sheets	50.00	@	—
Boards, per ton—			
Plain Chip	27.50	@	—
Solid News	30.00	@	—
Manila Lined Chip	37.50	@	—
Patent coated	47.50	@	—
Container Lined—			
85 Test	50.00	@	55.00
100 Test	55.00	@	60.00

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	1.50	@	1.55
No. 1 Hard White	1.40	@	1.45
No. 1 Soft White	1.00	@	1.10
Ledger & Writings	.45	@	.55
Solid Books	.25	@	.30
Blanks	1.00	@	1.05
Krafts	.70	@	.80
New Kraft Cuts	1.15	@	1.25
Manila Env. Cuts	1.25	@	1.30
Ex. No 1 Manila	.90	@	1.00
Print Manila	.30	@	.35
Overissue News	.30	@	.35
Old Newspapers—			
No. 1	.25	@	.30
Mixed Papers—			
No. 1	.15	@	.20
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper

(F. o. b. Mill)

Bonds	.04	@	.40
Ledgers	.06	@	.40
Writings—			
Superfine	.10	@	.18
Extra Fine	.15	@	.26
Fine	.15	@	.26
Fine, No. 2	.10	@	.25
Fine No. 3	.05½	@	.18
Book, M. F.	.04¾	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.06	@	.16
Coated Lithograph	.06	@	11
Label	.07	@	.11
No. 1 Jute Manila	.06	@	.09
Manila Sul., No. 1	.03	@	.05
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¼	@	.06
No. 2 Kraft	.03¾	@	.04¼
Southern Kraft No. 1	—	@	.03¾
Southern Kraft No. 2	—	@	.02¼
Common Bogus	.03	@	.04

(Delivered Philadelphia)

News Print Rolls	46.00	@	—
Straw Board	32.00	@	—
News Board	30.00	@	—
Chip Board	30.00	@	—
Wood Pulp Board	70.00	@	80.00
Binder Boards—			
No. 1, per ton	73.00	@	75.00
No. 2, per ton	62.00	@	65.00
Carload lots	60.00	@	65.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.03½	@	.04
New White, No. 2	.02½	@	.04
Light Silesias	.02½	@	.03
Silesias, No. 1	.03	@	.03½
Black Silesias, soft	.02½	@	.03
New Unbleached	.05	@	.05½
Washable, No. 1	.01	@	.01½
Blue Overall	.03	@	.03½
Cottons—According to grades—			
Washable, No. 2	.01	@	.02
New Blue	.01	@	.02
Fancy	.01½	@	—
New Black Soft	.02	@	.03
New Light Seconds	.01	@	.02
New Dark Seconds	1.50	@	1.75
Khaki Cuttings—			
No. 1 O.D.	.03	@	.03½
No. 2 Mixed	.02½	@	.03
Corduroy	.02	@	.02½
New Canvas	.03½	@	.04
New Black Mixed	.02½	@	.03

Domestic Rags (Old)

White No. 1—			
Repacked	2.50	@	3.00
Miscellaneous	1.75	@	2.00
M. G.	3.00	@	3.50
Thirds and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.50	@	1.75
Black Stockings (Export)	2.00	@	3.50
Roofing Stock—			
Foreign No. 1	.50	@	.75
Repacked	.70	@	.80

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.25	@	1.50
Domestic	1.50	@	—
Manila Rope	2.00	@	2.25
Sisal Rope	1.25	@	1.50
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.25	@	1.50
No. 2	.80	@	1.00
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	1.60	@	1.70
No. 2 Hard White	1.50	@	1.60
No. 1 Soft White	1.25	@	1.30
No. 2 Soft White	1.10	@	1.15
No. 1 Mixed	.50	@	.60
No. 2 Mixed	.40	@	.50
Solid Ledger Stock	1.00	@	1.10
Writing Paper	.75	@	.80
No. 1 Books, heavy	.55	@	—
No. 2 Books, light	.40	@	—
No. 1 New Manila	1.10	@	1.15
No. 1 Old Manila	.75	@	.80
Print Manila	.45	@	.50
Container Manila	.40	@	.45
Old Kraft	.85	@	.90
Common Paper	.15	@	.20
No. 1 Mixed Paper	.20	@	.25
Straw Board, Chip	.25	@	.30
Binders Board, Chip	.25	@	.30
Corrugated Board	.35	@	.40
Overissue News	.35	@	.40
Old Newspaper	.35	@	.40

BOSTON

Paper

(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.05½	@	.11½
Rag Content	.12	@	.30
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06¼
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	—	@	.04¾
No. 2 Kraft	—	@	.02¾

(F. o. b. Boston)

Southern Kraft	—	@	.02½

(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)

Common Bogus	.02	@	.02¾

(Delivered New England points)

News Print, rolls	44.50	@	—
Straw Board, rolls	.009	—	@35.00
Straw Board in Sheets, basis 35s to 70s	—	@	40.00
Filled News Board	—	@	30.00
Chip Board	27.50	@	—
Chip Board (Creasing)	27.50	@	30.00
Single Manila Lined Chip	—	@	37.50
Single White, Patent Coated News Board—			
Bender	45.00	@	55.00
Wood Pulp Board	70.00	@	75.00
Binder Boards	62.00	@	75.00

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Soft White	1.50	@	1.60
No. 1 Old Manila	.65	@	.75
No. 2 Mixed	.50	@	.55
No. 1 Mixed	.75	@	.85
Solid Ledger Books	1.20	@	1.40
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.60	@	.70
No. 1 Books, heavy	.55	@	.65
No. 1 Books, light	—	@	.30
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.25	@	1.30
No. 1 Old Manila	.55	@	.65
White Blank News	.95	@	1.00
Kraft No. 1	.90	@	1.00
Manila	.80	@	.90
No. 1 Mixed Papers	.12½	@	.15
Print Manila	.30	@	.40
Overissue News	.35	@	.45
Old Newspapers	.27½	@	—
Box Board, Chip	.17½	@	.20
Corrugated Boxes	.17½	@	.22½
Screening Wrappers	.25	@	.32½

Bagging

(F. o. b. Boston)

Gunny No. 1—			
Foreign	—	@	1.00
Domestic	.80	@	.85
Manila Rope—			
Foreign	1.40	@	1.50
Domestic	—	@	1.60
Transmission Rope	1.00	@	—
Mixing String	—	@	.30
Jute Rope	—	@	.75
Jute Carpet Threads	.25	@	.30
Bleachery Burlap	1.75	@	2.00
Scrap Burlap	.60	@	1.00
No. 1 Scrap Burlap	.80	@	.90
Scrap Sisal	.75	@	.85
Scrap Sisal for shredding	.90	@	1.00
Wool Tares, heavy	.65	@	.75
New Burlap Cutting	.75	@	.90
Australian Wool Pouches	—	@	1.50
Heavy Baling Bagging	.90	@	1.10
Paper Mill Bagging	.50	@	.60
Bagging No. 2	.20	@	.25
No. 1 Burlap	1.80	@	2.00

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	—	@	.01½
New White No. 1	.03¾	@	.04
New White No. 2	.02¾	@	.03¼
Silesias No. 1	—	@	.03
New Black Silesias	.02½	@	.02¾
New Unbleached	.05	@	.05¼
Fancy	—	@	.02½
Washable	—	@	.01¾
Cottons—According to grades—			
Blue Overalls	—	@	.03¾
New Black, soft	.04	@	.04½
Khaki Cuttings	.03	@	.03¼
O. D. Khaki	.03½	@	.03¾
Corduroy	.02¾	@	.03
New Canvas	—	@	.05
B.V.D. Cuttings	.04	@	.04¼

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.00	@	2.25
White No. 2—			
Repacked	.02¼	@	.02½
Miscellaneous	.02	@	.02¼
Twos and Blues	.90	@	1.00
Thirds and Blues—			
Repacked	.75	@	.85
Miscellaneous	.70	@	.75
Black Stockings	2.00	@	2.25
Roofing Stock—			
No. 1	.32½	@	.37½
No. 2	.30	@	.35
No. 3	.25	@	.30

Foreign Rags

(F. o. b. Boston)

Dark Cottons	.50	@	.60
New No. 1 White Shirt Cuttings	3.75	@	4.00
Dutch Blues	1.25	@	1.50
New Checks & Blues	2.25	@	2.50
Old Fustians	—	@	.75
Old Linsey Garments	.55	@	.65

TORONTO

Paper

(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.10¼	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.10¾	@	
No. 2 Colored	.09	@	.10½
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.65	@	—
No. 3 M. F. (Carloads)	6.20	@	—
No. 4 M. F. (carloads)	5.25	@	—
No. 1 S. C. (carloads)	7.15	@	—
No. 3 S. C. (carloads)	6.65	@	—
No. 4 S. C. (carloads)	5.70	@	—
No. 1 Coated and Litho	12.50	@	—
No. 2 Coated and Litho	11.50	@	—
No. 3 Coated and Litho	10.00	@	11.50
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.40	@	—
White Wrap	2.00	@	—
"B" Manila	4.90	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.75	@	—
Kraft No. 2	5.40	@	—

(F.O.B. Cars Toronto)

News, per ton—			
Rolls (contract)	45.50	@	—
Sheets	50.50	@	—

Pulp

(F. o. b. Mill)

Ground Wood	18.00	@	20.00
Sulphite easy bleaching	40.00	@	—
Sulphite, news grade	38.00	@	—
Sulphite, bleached	48.00	@	58.00
Sulphate	50.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings			
White Env. Cut	1.80	@	—
Soft White	1.40	@	—
White Blk. News	1.25	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	—
Light and Crumpled Book Stock	.80	@	—
Ledgers and Writings	1.00	@	—
Manilas—			
New Manila Cut	1.25	@	—
Printed Manilas	.55	@	—
Kraft	1.75	@	—
News and Scrap—			
Strictly Overissue	.50	@	—
Strictly Folded	.50	@	—
No. 1 Mixed Paper	.40	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09½	@	.10
Fancy Shirt Cuttings	.06	@	.06½

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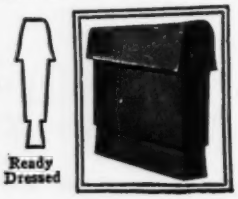

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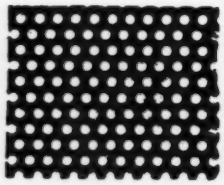

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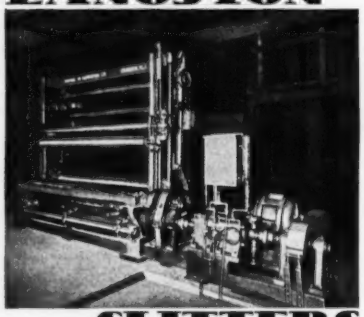

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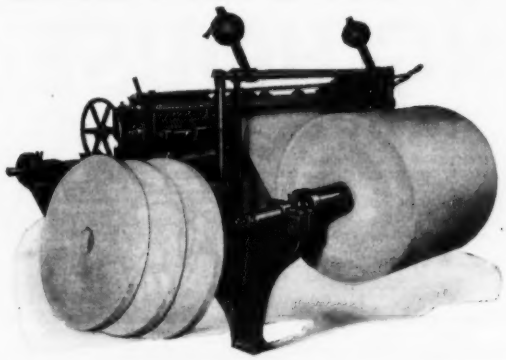

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IF YOU are open to overtures for new connections and qualified for a salary between $2,500 and $25,000, your response to this announcement is invited. The undersigned provides a thoroughly organized service, of recognized standing and reputation, through which preliminaries are negotiated confidentially for positions of the calibre indicated. The procedure is individualized to each client's personal requirements, your identity covered and present position protected. Established twenty-two years. Send only name and address for details. R. W. Bixby, Inc., 117 Delward Bldg., Buffalo, New York.

WANTED—Experienced beater engineer. Require man skilled in manufacture of high grade Bond and Ledger papers. Send complete information as to age, experience and general details to Box 32-436, care Paper Trade Journal. N-17

A RESPONSIBLE mill wants man to install and supervise converting plant to make high grade napkins and tissue specialties. Address Box 32-435, care Paper Trade Journal. N-3

WANTED—Paper mill help for mill in Hudson Valley. Good opening for top notch men. Machine tenders, back tenders experienced on specialties. Also experienced mechanic and trimmer operator. Address Box 32-431, care Paper Trade Journal. N-10

OLDEST FABRICATOR of heavy sacks in this country wants an engineer, about 30-35, with some outside experience. Apply by letter only, in complete confidence. Address Box 32-416, care Paper Trade Journal. O-27

SITUATIONS WANTED

PLANT ENGINEER—20 years experience in mechanical, structural and reinforced concrete engineering. Power plant, general plant layout. 39 years of age. Address Box 32-426, care Paper Trade Journal. N-10

GRADUATE CHEMICAL ENGINEER AND PRODUCTION SUPERVISOR. Nine years experience in research and charge of production. Viscose cellulose film, transparentized paper, lacquered and varnished papers, oil proof paper—Container board, rubber coated paper. Address Box 32-414, care Paper Trade Journal. O-27

PLANT ENGINEER—17 years experience in paper and pulp mill operation, maintenance, power and construction. Graduate engineer. References. Address Box 32-350, care Paper Trade Journal. N-10

LIST YOUR WANTS HERE

SITUATIONS WANTED

ENGINEER DRAFTSMAN—Age 31, eleven years experience in News, Bond and Kraft Mills. Thoroughly capable of planning, laying out, estimating, supervising construction and mill maintenance. Now employed. Reference. Address Box 32-409, care Paper Trade Journal. O-27

FOURDRINIER MACHINE TENDER. 20 years experience. All grades of Paper. 43 years old. Married. Steady. Reliable. Address Box 32-399, care Paper Trade Journal. O-27

EFFICIENT Board Mill Superintendent available. Years of experience manufacturing Box Board, Tag and Specialties, Construction and rebuilding old mills. References. Address Box 32-105, care Paper Trade Journal.

WANTED position as superintendent. Experienced on all grades of Stock Rag Rope Jute and Wood Fibres, Tissue Kraft and Wax. Address Box 32-279, care Paper Trade Journal. T.F.

OFFICE MAN (Christian) Accountant, having several years experience in Paper and Twine business desires connection with Paper or Twine company. Honest, trustworthy and reliable. Address Box 32-427, care Paper Trade Journal. N-3

SALESMAN with extensive selling experience to coarse and fine paper jobbers, also convertors, in Southern Territory, desires mill connection. Salary or commission. Address Box 32-428, care Paper Trade Journal. O-27

MACHINE TENDER wide, fast kraft machines and fourdrinier board. 34 years of age. Address Box 32-415, care Paper Trade Journal. O-27

SECRETARY-STENOGRAPHER—Rapid English and German typist, bookkeeping, technical translations, many years experience paper trade, good references. Address Box 32-440, care Paper Trade Journal. N-10

CHEMICAL ENGINEER—Two years experience with internationally known firm closely associated with pulp and paper industry. Desires position. College graduate. Excellent references. Address Box 32-441, care Paper Trade Journal. N-3

MISCELLANEOUS

CLARK MANUFACTURING COMPANY, Holyoke, Mass. Telephone 1828. Builders of cylinder moulds, couch and felt rolls, dandy rolls. We cover dandies and cylinders tight, for fast running machines. †f

Address Replies

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New York, N. Y.

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WANTED—Two 76½" or 81" Automatic Hudson Job Machines. Give full particulars. Address Box 32-424, care Paper Trade Journal. O-27

WANTED—M G Dryer for 120" trim. Address Box 32-434, care Paper Trade Journal. N-3

FOR SALE

FOR SALE—Paper Mill Machinery consisting in part of 42 and 48 inch Diameter 84 inch Face Driers, complete with drives, Wet End, Screens, Calenders, Winders, Beaters, Jordans, Pumps, Pulleys, Hangers, Steam Engines, D.C. Motors, Generators, etc. Address Box 32-417, care Paper Trade Journal. N-3

FOR SALE—Two 67½" Dietz Perforators; perfect condition, now running—or / and will buy one or two 81" Perforators at attractive price. Address Box 32-432, care Paper Trade Journal. O-27

PAPER COATING MACHINERY—Waxing, Oiling, Gumming, Gluing, Asphalt Duplexing Laboratory Coating and Treating machines. High speed. New improvement. MAYER COATING MACHINES COMPANY, INC., Rochester, N. Y. T.F.

FOR SALE—Complete wax paper manufacturing plant in the East, or contents thereof. Immediate possession. Reasonable price. Address Box 32-439, care Paper Trade Journal. O-27

FOR SALE

1—Pusey and Jones Fourdrinier Paper Machine. Wire 104" by 65 feet. Three sets presses. 30 Dryers 48" by 102". Ten roll stack of Calenders. English Reel.

1—Pusey and Jones Fourdrinier Paper Machine. Wire 84" by 65 feet. Three sets presses. 30 Dryers 48" by 80". English Reel.

2—Stacks machine calenders 126" face.

1—Jones beater 61" x 48".

3—No. 2 Lannoye pulpers.

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SITUATIONS WANTED

FINE MILLS—Superintendent will be open for engagement, 25 years' experience on fine grades of tube sized papers, rag and sulphite specialties, sensitizing absorbent book and coating. Practical paper maker and technician conversant with modern equipment and closed system. Would consider position in experimental mill. Best references. Address Box 32-438, care Paper Trade Journal. N-17

SITUATIONS WANTED

TECHNOLOGIST—Now available—young man technical training and few years high grade mill and laboratory experience with large New England organization manufacturing pulps, fine papers, coarse papers, cylinder boards, sulphite tissue and colored specialties. Willing to start in minor capacity as junior chemist; process, operation control, development, or sales and service engineer. Address Box 32-437, care Paper Trade Journal. N-3

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Experienced Envelope Superintendent and Envelope Adjusters. Address Box 32-389, care Paper Trade Journal.

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Battery of two 200 H.P. Sterling horizontal water tube boilers, 140 lb. working pressure, class A—No. 15—196— 3¼" tubes, 3 steam drums 36" diameter—1 mud drum—42" diameter—full c.i. front—battery brick settings—equipped with No. 2 twin lever grates—6' 6" x 7' 6" long—model G Diamond soot blowers and all regular fittings. Address Box 32-433 care Paper Trade Journal. 0-27.

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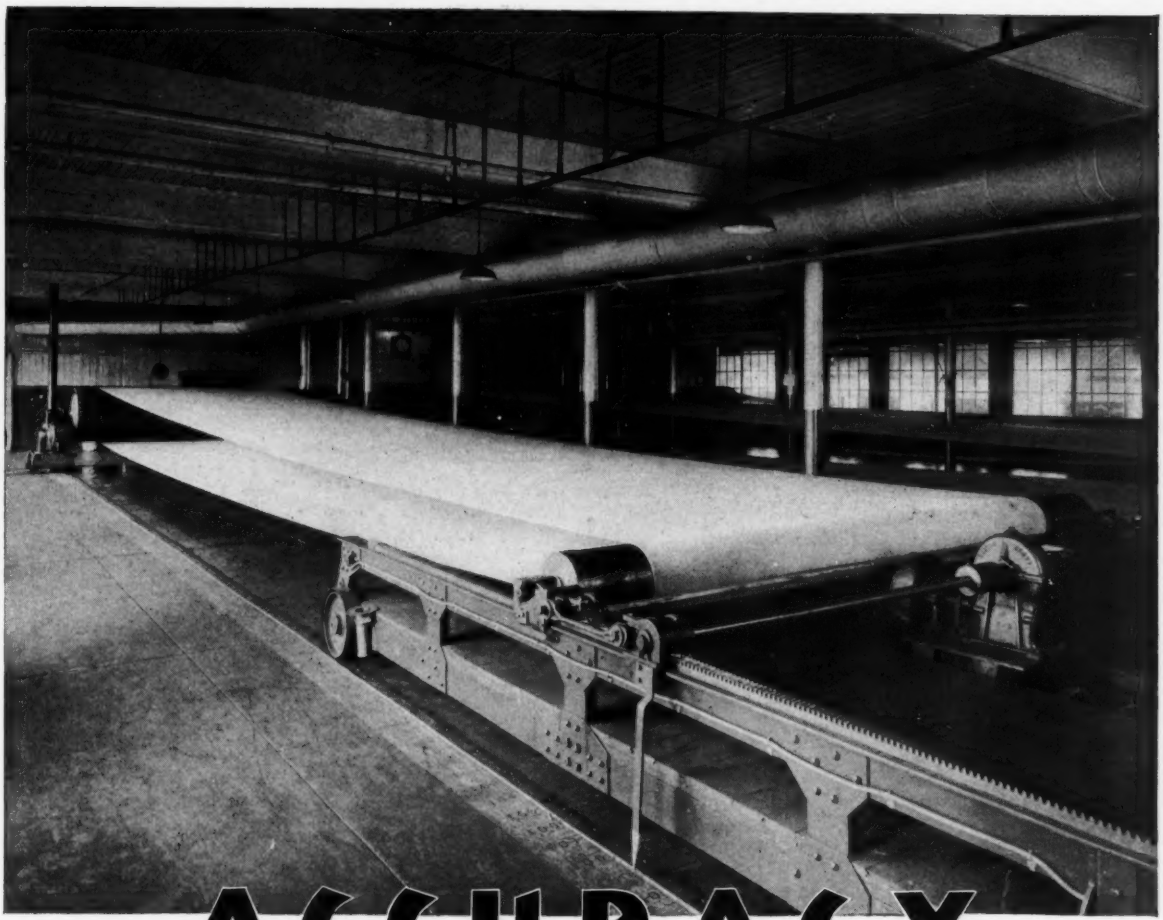

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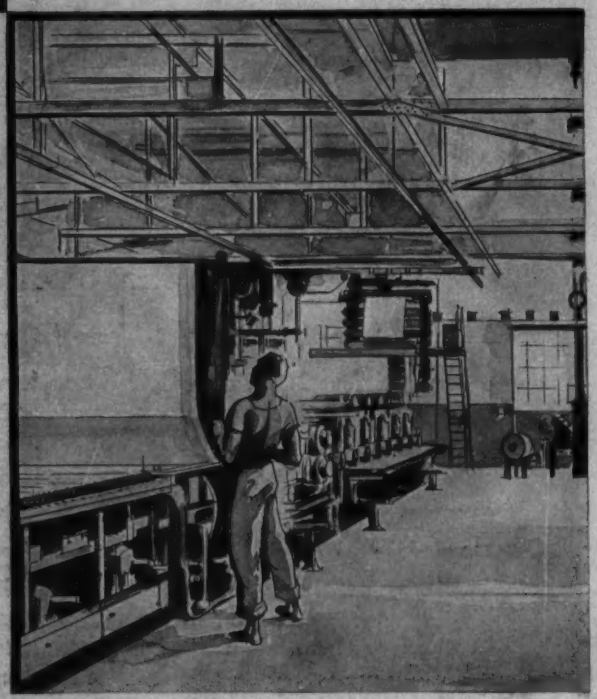

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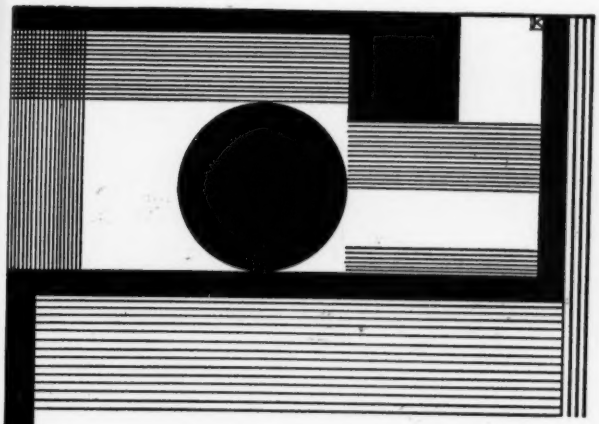

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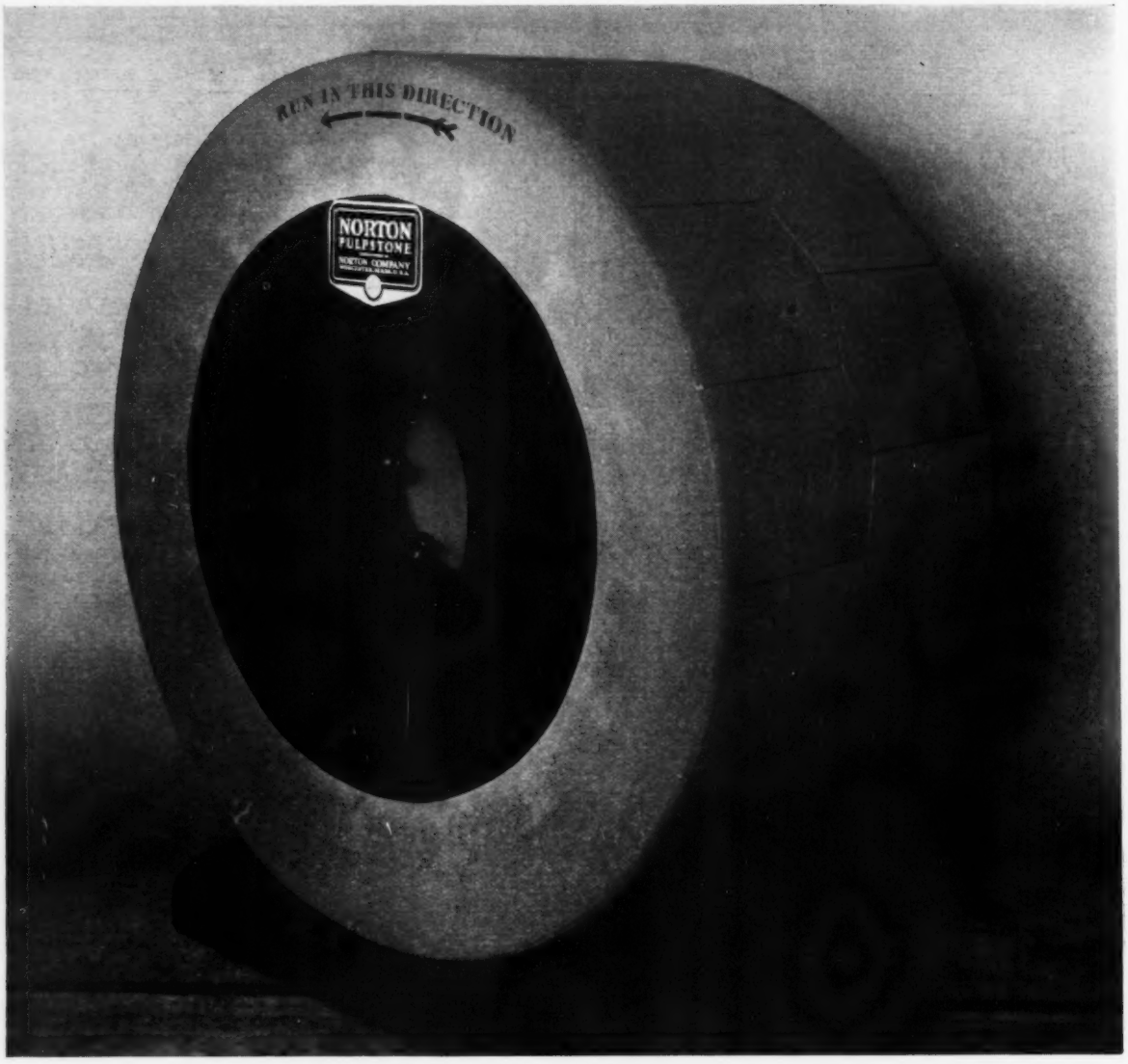

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